THE ARCHITECTURAL FORUM

IN TWO PARTS PART ONE

ARCHITECTURAL DESIGN

APARTMENT HOUSE REFERENCE NUMBER

SEPTEMBER 1930

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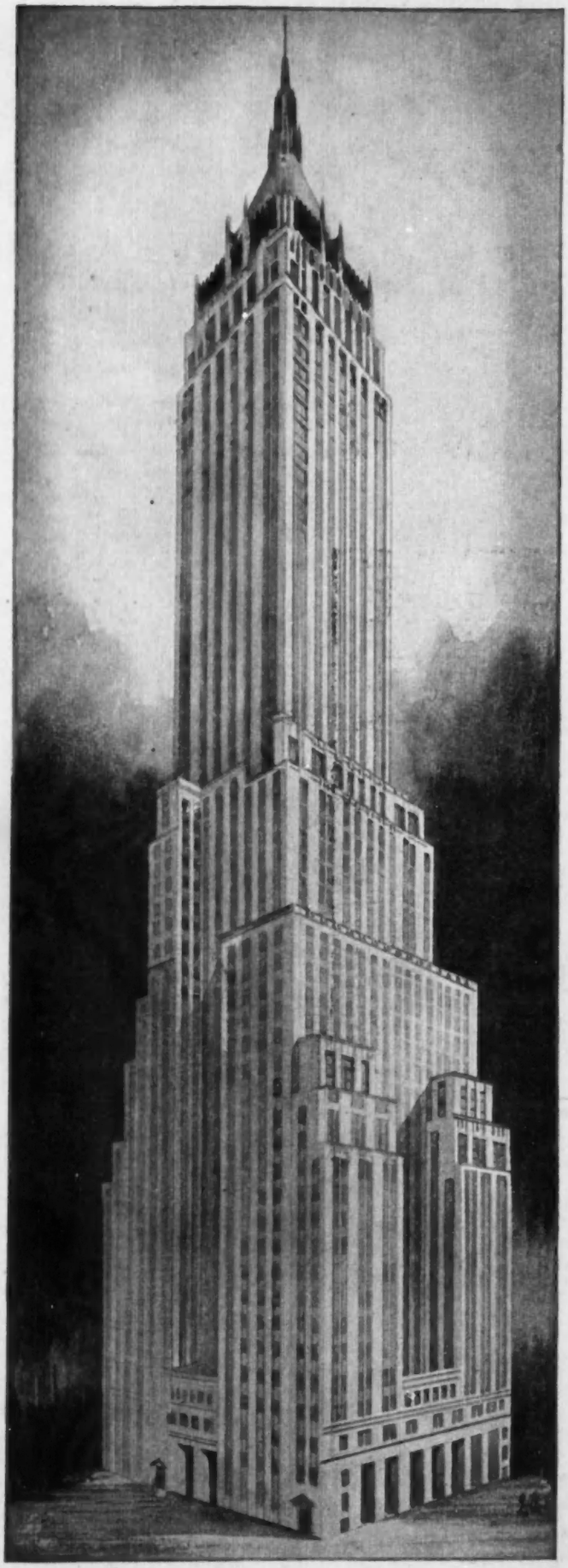

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BOOK DEPARTMENT

THE PINE FURNITURE OF EARLY NEW ENGLAND

A REVIEW BY
CLIFFORD WAYNE SPENCER

THE charm of early American furniture lies largely in its primitive simplicity and in the fact that each piece is highly personal. It was made by an individual for another individual, with its ultimate use definitely in mind. It is an expression of that urge to produce beautiful things that is so strong in the makeup of all of us. If it be true that to be beautiful an article must be useful, these implements of every-day life in the homes of the early settlers certainly fulfilled all the requirements of true beauty. Added to the qualities of simplicity, utility and personality, there are the endearing influences of historical association, and the mellowing touch of time, sharp edges softened by the wear of long use, and above all the marvelous patina that can be acquired only by beautiful woods after a long period of use and with constant rubbing and waxing. These are the qualities that cannot be duplicated and that account for the great interest and love that so many people have come to have for the simple objects with which the early inhabitants of this country surrounded themselves. It is never claimed that the work of these early cabinet makers represented the last word in the furniture maker's art; it was too limited in the quality of its material, the nature of the tools with which the craftsmen worked, and the necessity of making articles to withstand hard usage, to attain anything even approaching perfection. In fact it was these very shortcomings that lend to their products their greatest charm,—soft woods worked by hand with simple moulding planes and workmanship not too skilled.

In the choice of the woods which the early craftsmen employed, they were probably interested primarily in those that were easily worked and durable. At first it was thought that only oak, of the native woods, would be sufficiently durable, but it was soon discovered that although quite soft and light, the wood of the white pine was capable of withstanding hard usage and long wear, and that where an especially hard wood was desired the so-called hard pines would answer very well. The smoothness of the grain of the white pine and its softness gave to it the added advantage of being easily worked, which in those days of primitive tools was a great advantage. Their choice of pine as the principal wood for building furniture and interior woodwork has proved very fortunate, for the centuries that have passed have demonstrated that the wood is capable of withstanding unlimited wear and that in varying lights it takes on a great number of rich and agreeable color variations ranging from a bright red to a light cream color, and that the wear and tear of rough usage only serve to add to the general effect of softness and mellowness. The patina assumed by pine after a long period of use furnishes a clue to the genuineness of a piece, since it cannot be reproduced successfully by any modern method of finishing, and it adds still further to the mellow charm of an authentic old piece.

In the volume which is the subject of this review the author has selected his material carefully from examples of the colonial cabinet maker's art which were found in New England and which are constructed either wholly or largely of pine. In presenting a subject such as this the matter of careful selection is of the greatest importance, since it does not follow that because an object is old it is necessarily good. Probably the proportion of ugly pieces in relation to the beautiful was as great in those days as it is today, and while a great majority of the ugly pieces have ceased to exist for that very reason, there are still in existence large numbers of relics which are interesting only on account of their age and which have no place in a volume of this sort. In this case the selection seems to have been very well and carefully made, with an eye to their beauty and also to their adaptability to reproduction. The author evidently was inspired by a great love for his subject and a true understanding of the intrinsic beauty found in the furniture of this period and class. It is also evident that he or his photographer had access to many collections in private homes as well as to those in public museums. In most cases great care has been taken to present the objects in connection with their proper backgrounds of authentic early American interiors. In these instances the author's architectural training has stood him in good stead, and nothing is shown that is not in agreement with the dictates of good taste.

In addition to the plate section, which constitutes the major portion of the volume, an introduction by the author presents a general view of the subject to be discussed and will afford the reader, especially if he be comparatively unfamiliar with the subject, an adequate understanding on which to base his enjoyment of the volume. Some knowledge of the woods to be used is of prime importance to such an understanding, and the author discusses in the order of their importance the various woods which played a part in the construction of furniture in the early American period, especially in New England. In this classification white pine naturally takes first place. Its good qualities are explained, and the reader is shown how he can distinguish between the various kinds of pine in common use in this country prior to the Revolution. The second important phase

of the furniture maker's art which should be understood in order to be appreciated, includes the fundamental principles of the construction of furniture. In these there has been little change since the days of the Pilgrims, and while in some cases the workmanship is more crude than might be the case with modern machine methods, the same tricks of joinery and finish are still in use. Dovetails may now be concealed by the skilled cabinet maker, but the principle is the same, and the methods of paneling developed in finishing the homes of the seventeenth and eighteenth centuries have lent charm to the interior of many a modern home. Although the present work deals primarily with furniture of wood construction, these pieces would not be complete without the embellishment of their wrought iron hinges, latches, or other hardware accessories. In his description of this portion of the subject the author traces the development of hinges from the hardwood peg stage to the more elaborate wrought iron pieces in the making of which the colonial smiths attained considerable skill. In many of the more elaborate pieces, especially those of a slightly later date, brass hardware figured prominently, and the various patterns and styles are described in this portion of the volume.

The plate section of the work is remarkable for the beauty of the photography and printing as well as for the character of the subjects presented. There are 228 full-page plates, each showing a reproduction of a photograph of some unusual and interesting piece or group of pieces. Many of the photographs are by Charles Darling, and their soft, mysterious quality is in perfect keeping with the general feeling of the work. The simplest pieces are often the most beautiful, and the group of small wall boxes that forms the first section comes within this classification. The purposes of these boxes were varied, and their uses included the holding of candles, knives, and pipes. The more elaborate boxes include tiny drawers, some of them being veritable little chests of drawers. The collection of pipe boxes is especially interesting, and the ease with which they could be duplicated by anyone at all handy with tools suggests a pleasant occupation for rainy afternoons and Sundays. Chests formed an important part of the equipment of every colonial household, and the large collection shown here is quite representative of the different types that found favor with the early housekeepers as places for the storage of linens and clothing. They are made especially interesting to the architect by being shown in proper settings, often surmounted by some appropriate implement of household use. The author and his assistants must have gone to considerable trouble in finding just the proper background against which to show each of these objects. The natural development of the chest into the chest of drawers is followed, the "chest of drawers on frame" being developed still further to become the "highboy" and "lowboy." As is to be expected, many of these pieces are quite elaborate and surprisingly beautiful. The section covering stools and benches is replete with examples of the originality and ingenuity which characterized so much of the work of the early craftsmen. A bench formed of a plank and four straight legs is so well treated in detail that what might have been clumsy and ugly has taken on an extremely graceful appearance, while other pieces owe their claim to beauty to their sheer massiveness. An

interesting variation of the bench is the settee, often placed before an open fire, its high-boarded back evidently designed to prevent drafts. An unusually beautiful bench of this sort has an interesting paneled back and arm rests sawn to an amusing profile. Other variations of the bench were the "settle bed," the "chair table," and the "settle table."

The variety of tables shown here indeed covers all sorts. There are tiny stands for holding candles and huge trestle tables which might be taken apart and put away between meals; there are hutch tables with little chests beneath the tip tops, and all sorts of gate-leg and butterfly tables in every shape and size. The desks illustrated are of many kinds. The section on cupboards and shelves includes some very fine old dressers, and one or two useful suggestions for the arrangement of shelves in paneled rooms are given. The sign boards which the author has included along with the furniture are amusingly quaint and no doubt will be a source of much inspiration to architects in the designing of similar decorative signs for their buildings. Although it is no longer customary to make weather vanes of wood, the pine vanes illustrated here are very good in design and their forms might be easily adapted for other materials.

In addition to all these variations in furniture, it seems that there was scarcely anything that the early settlers needed that could not be fashioned from pine. Mirror frames, lanterns and even chandeliers are shown, in the construction of which pine has been used, due no doubt largely to the fact that it is a wood that can easily be worked by amateurs, and this same quality will doubtless suggest to many who see these plates the possibility of reproducing some of the pieces for themselves. For these and others who are interested in the actual design and construction of the pieces, there is included a section of 55 full-page plates of measured drawings, showing the details of construction and design of many of the pieces shown in the illustrations in the volume.

PINE FURNITURE OF EARLY NEW ENGLAND. By Russell Hawes Kettell. Plates and text, 9¼ x 12⅜ ins. Price $15. Doubleday, Doran & Co., Inc., Garden City, N. Y.

RATHER than to present an encyclopædic treatise on shadow projection, the author has confined this work to an analysis of methods employed for all forms, with demonstration of those considered most typical. In all cases the forms chosen have been designed to explain the principles of shadow projection, and for no other purpose. The first and second parts of the volume deal with the shade and shadows of points, lines, shapes and forms, and the third part with the shade and shadows of more complex forms; the fourth part gives a series of rapid methods for complex forms, and the last part shows methods of projecting shadows on interpenetrating forms which are designed so as to introduce minor complexities. Shadow projection is a means to an end. Its usefulness is limited to those forms which bear obvious geometrical analysis. The diagrams are simply presented and are very readily understood.

ARCHITECTURAL SHADOW PROJECTION. By John M. Holmes. 58 pages, 9½ x 13 inches. Illustrated, cloth. Price 10s/6d. The Architectural Press, 9 Queen Anne's Gate, Westminster, S.W. 1, London. To be ordered directly from publishers.

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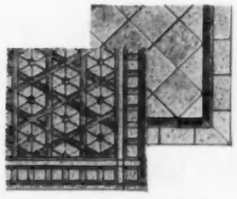

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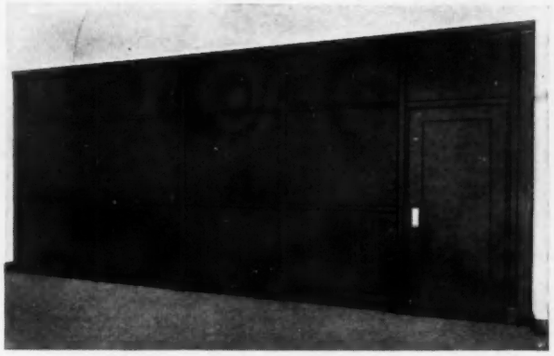

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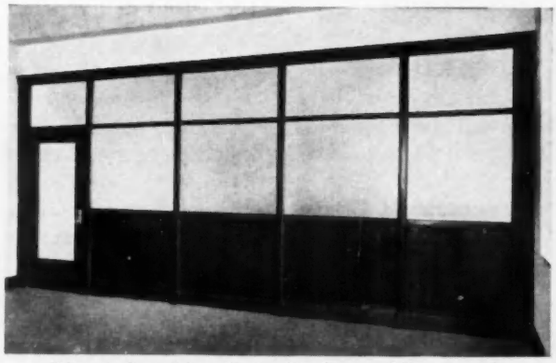

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THE EDITORS' FORUM

SIR ASTON WEBB
1849—1930

DURING the latter part of August, announcement was made of the death in London at the age of 81, of Sir Aston Webb, regarded by many as the foremost among British architects. Sir Aston was the recipient of many honors in both England and America. In addition to having served as president of the Royal Academy, in itself a distinction of high order, he was awarded the British Gold Medal in 1905. He was one of two British architects to receive from the American Institute of Architects its gold medal for distinguished architectural achievement. Born May 22, 1849, he was educated privately, received the honorary degree of Doctor of Laws from Cambridge, and was knighted by Edward VII in 1904. Sir Aston Webb was emphatic in expressing his aversion to the modern skyscraper, and was strongly opposed to its appearance in London, where he maintained that conditions for erecting such buildings are unfavorable. He will be best remembered as architect of the Admiralty Arch, the structure leading from Charing Cross to the Mall; the buildings of the Imperial College of Science, and the new buildings of the Victoria and Albert Museum at South Kensington; and particularly as the designer of the new exterior which some years ago was given to Buckingham Palace, the London home of the British sovereigns.

ENLARGED STAFF AT NEW YORK UNIVERSITY

DEAN BOSSANGE, of the Department of Architecture, New York University, announces the appointment of George A. Licht as an additional critic in design for the coming year. Mr. Licht, the winner of the first Paris Prize in 1904, has served with the faculties of Princeton and Columbia, and in addition has had for many years an atelier of his own, which has won many high awards in the Beaux Arts Institute competitions. This addition to the design staff of New York University, which already includes Burnham Hoyt, George S. Koyl, Will Rice Amon, A. C. Schweizer, and E. O. Holien, makes it one of the strongest departments in this country and will undoubtedly enable its students to maintain and probably excel the exceptional record established during the past year. DeWitt C. Pond, the well known architectural engineer, will be added to the staff in charge of construction, and will assist in developing the new option in architectural engineering. In view of the very great importance of construction in modern functional architecture, it is proposed to develop and strengthen the courses in that subject and to relate such courses very directly to the work in design.

The new quarters of the department, at 250 East 43d Street, are within a block of the Beaux Arts Institute of Design and in close proximity to many of the most important architectural offices in this country. High above the streets, the lecture rooms, library, atelier and drafting rooms are admirably lighted and most commodious. Although much larger than the old quarters, they would be more than filled by the large number of applicants, and admission will be placed on a competitive basis; 75 students were enrolled in the summer session this season. A number of these students came from other institutions during their vacations in order to enjoy the exceptional opportunities offered in New York. To assist students in such study, it is proposed next year to offer a number of inspection visits, under the leadership of specialists, to many of the extraordinary examples of modern work which New York contains.

The great success of the course in "Modern American Problems," open to the public, which was given last spring, proves the importance of such study at this time. A second series will be offered during the coming year and also a new series on the "Promoting and Financing of Building Projects." Practicing architects recognize more and more the necessity of knowledge of these subjects, and interest shown in this course since it was announced assures its popularity.

In September, 1931, two new five-year courses will be inaugurated, leading to degrees. These courses will be added because it is becoming more and more difficult to give an architectural student adequate training in only four years. It is proposed also in 1931 to offer for women a special course in architecture leading to the degree. This course will be similar to the existing courses and will include the fundamental work in construction, meeting fully the requirements of this state. But it will recognize the special aptitude and also the limitations of women for architectural work, and emphasis will be placed on residential work and interior decoration. Few women are numbered among the most successful architects, and yet the importance of the woman's point of view, experience and taste, when it comes to domestic architecture is recognized and commented upon. In this course a special series of problems in design will be given, including country and city houses, tenements, apartments and hotels.

JOSEPH EVANS SPERRY
1854—1930

THE death of Joseph Evans Sperry, one of the best known Baltimore architects, occurred August 7 at his home in Guilford, a Baltimore suburb. His name has been closely linked with the growth of the Johns Hopkins University and Medical School. He designed the civil and mechanical engineering buildings at Homewood. He also designed the dispensary, Institute of Pathology, Halstead and Osler clinics (now under construction), the Wilmer Eye Institute and the women's clinic in the medical and hospital group of the institution. The Union Memorial Hospital, together with the Johnston Children's Clinic and the Bauernschmidt Memorial, also were designed by Mr. Sperry. Other buildings he designed include the Equitable and Calvert Buildings, the Emerson Hotel, the Emerson Tower Building, and the Emersonian Apartments.

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APARTMENT HOUSE REFERENCE NUMBER

PART ONE—ARCHITECTURAL DESIGN

PART TWO—ARCHITECTURAL ENGINEERING AND BUSINESS

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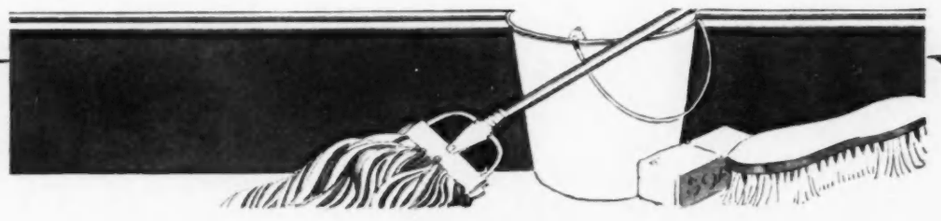

TEN GRACIE SQUARE, NEW YORK
VAN WART AND WEIN, ARCHITECTS

FROM A WATERCOLOR DRAWING
BY EARL HORTER

THE
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VOLUME LIII NUMBER THREE

SEPTEMBER 1930

THE MODERN APARTMENT HOUSE

BY
FRANCIS S. BANCROFT
VICE-PRESIDENT OF PEASE & ELLIMAN, INC.

THERE is no doubt that the architect has exerted as strong an influence on the phenomenal development of the apartment house, which has been a feature of the past two decades, as any other one factor. Of course the fact that Manhattan, being an island, can never be spread out over more than the original area, has made it economically unsound for only one family to live on a plot of land which is continually increasing in value, and the scarcity of servants at reasonable wages has made it nearly impossible for any but the ultra-wealthy to run a large house efficiently. The result of these two difficulties would have become acute had not the architect gradually evolved an apartment design which was acceptable to a large portion of New York's population.

In the beginning, apartments which were then known as French flats, were not popular, and their occupancy was confined to those who desired or were forced to economize. It was the development of the coöperative which first gave a spur to and public recognition of apartments, a movement which was started about 1880 by T. G. Hubert, of Hubert and Pierson. These houses approximated as closely as possible the arrangement of an attractive private dwelling. In the early years of the present century, cooperatives, under the name of "Home Clubs," introduced the first duplex apartments.

By 1900 an apartment house plan was developed which appealed to those of moderate circumstances. The wealthy classes were still living in private dwellings, oblivious of the fact that within the next fifteen years they would themselves be apartment house tenants. The typical building then was of seven stories with an elevator, with a height restricted by law to not more than eighty-five feet. The usual family suites consisted of six rooms and a bath. The apartment was entered through a very small foyer, opening on a long narrow hall off of which opened the parlor, three chambers and a bath. To enter the dining room it was necessary to go back through the long hall and turn on a passageway at right angles. The dining room was connected with the kitchen and an adjoining bath. Even in the few apartment houses which had suites renting at the then staggering sum of $10,000 a year, the same long winding hall was introduced. The only essential difference between the two was the inclusion of more baths and a few small rooms such as a library, a billiard room, etc.

The plan introduced by J. E. R. Carpenter some years ago, where the rooms were regrouped with entertaining rooms on one side of a gallery and bedrooms on the other gave a great impetus to the increased popularity of the apartment house. This plan is to this day universally used. Since these beginnings the apartment house has so developed that it can now include features which could not be found in any private house.

The ideal way to erect an apartment house today is to have complete coöperation between the builder, the architect and the renting man. The builder can discuss a plan which would return him a satisfactory return on his investment, the architect one which will be æsthetically pleasing and utilize every foot of space advantageously, and the renting man one which will contain the features demanded by and most pleasing to prospective tenants. Without this complete understanding between the three forces behind any apartment building, the builder would perhaps indulge his wish to obtain the maximum number of apartments in a building to a point where there would be many unrentable apartments, the architect would be more likely to go to the other extreme, and the renting man would be left with

an impossible problem.

The first thing which is demanded by the apartment public today is spaciousness. Even if the rooms cannot be very large, a design giving the effect of space proves popular. Wide doors, ceilings as high as possible, windows placed to utilize every ray of the morning and afternoon sun, and permitting proper furniture placing, well-planned closets and bathrooms are a necessity today. No longer will a prospective tenant be satisfied with shallow and inadequate closet space, dark and poorly ventilated bedrooms, for the sake of roomy entertainment rooms. The same feeling of space must be applied to all of the rooms, with the possible exception of the kitchen, where, the introduction of so many mechanical devices and the desire of most servants to have all cooking equipment and cupboards as nearly contingent as possible make compactness desirable in this room. The introduction of the dining alcove in small apartments has proved popular as the subsequent saving of space enables these suites to have facilities not previously obtainable.

The builder and architect today must include in their buildings all of the modern conveniences if they wish to meet competition in renting. Mechanical refrigeration is today an absolute necessity. Bathrooms equipped with glass-enclosed showers attractively tiled in the modern manner are a renting aid. Radio outlets in all living rooms, a large supply of telephone and base electric light plugs, wood-burning fireplaces, cedar-lined closets, are all desirable. One of the most interesting developments in the last five years is the growth in popularity of pent-house and terrace suites.

In 1900 an apartment house on Riverside Drive was considered a wonder because it had on the roof two summer house pavilions which were open to all of the tenants in the building. Gradually the idea of utilizing this space for apartments where the tenants could have their private roof gardens in gardenless New York became popular. Today the pent-house suites are usually the first to rent in a building. With the advent of the new Multiple Dwelling Law, with its required number of set-backs, the terraced suite has reached a new development. Today builders are including these terraces which furnish the equivalent of a front porch wherever possible. These are usually decoratively tiled, have ornamental railings, and, in some instances, connections for a fountain. Every builder and architect should include in their plans as many of these suites as possible. Even if they can only be large enough to include a few plants, the view furnished and the long French doors through which they are usually approached, have great public appeal.

There is still one respect in which apartments are undesirable, and that is the living quarters for servants. Even in some of the de luxe apartments the sleeping quarters for servants are little above the tenement house class. The efficient servant passed years ago out of the drudge class and today commands a respectable salary. The day will come when tenants in buildings will find the servant problem acute unless better accommodations for them can be offered. In many buildings it would take nothing short of magic to provide adequate service rooms as well as spacious apartments for the tenants, but this is a problem to which much care must be given both for economic and humanitarian reasons.

There are two extremes in apartment planning which the architect must avoid if he wishes his building to be a financial success. One is the growing tendency to provide very large rooms, a tendency which, in some cases, passes all economic necessity and wastes space which might be better utilized. The other is the complete acceptance of the builder's desire to include a certain number of rooms in a building. If a building is so standardized and commercialized that each floor must have a given number of apartments, regardless of the number of baths, closets or maids' rooms, the result is a number of unrentable suites and an unsatisfactory yearly return to the builder on his investment.

Sutton Place

CRITICISM OF APARTMENT ARCHITECTURE

A CRITICISM AND A PROPHECY

TO justly criticize American apartment houses one must consider the many sides of the problem. First there is the fact that, like the office building, the apartment house is, strictly speaking, a commercial proposition. To bring in a reasonable return on the money invested is the end to be sought in any apartment house project. Therefore, the all-essential factor is an economical, convenient, well arranged plan. Architects most surely have accomplished this during the past 20 years of intensive apartment house construction. Today there is no excuse for any architect's designing a poorly planned apartment house. The plans of countless successful buildings of this very specialized type and purpose are available for his information and inspiration. Architects have reduced to a formula the problem of planning a successful apartment house. The most difficult problem is that of the coöperative apartment, to fit together in a given amount of space the varying plans of the different privately owned apartments. To plan successfully such de luxe coöperative apartments is an architectural problem of the first magnitude, —buildings in which one-, two- and even three-story apartments have to be dove-tailed together.

Second, and of real importance because of its effect upon the public and the environment, is the exterior design of the apartment house. Subconsciously, architecture affects and moulds public artistic taste more than does any of the other arts. In apartment house design for the past 25 years there has been little or no change. Based upon an unsuccessful and unsatisfactory attempt to impose one or another of the traditional styles upon the exposed facades of these great and small rectangular boxes, the result has been dry, monotonous and uninspiring. Superimposed orders, elongated to fit several stories; classic cornices and string courses, horizontally dividing towering wall surfaces into layers of varying width, have characterized the designs. Great masonry cakes of thick and thin layers, always topped off with a generous, overhanging frosting in the shape of a colossal classic cornice, with or without a supporting frieze, are found everywhere. As in the design of the office building, so also in the design of the apartment house, its commercial sister, the advent of steel with its possibilities of limitless height found the American architect unprepared and uninspired. His training in traditional styles unfitted him for the novel and tremendous task of creating multi-storied structures.

Evolution in architectural design has made tremendous and encouraging progress during the past five years. The fetters of traditional adherence are fast falling away. Architectural design is entering upon a period of the greatest potentialities. With imagination and inspiration untrammeled and unimpeded by traditional prejudice, may not the architect of today and tomorrow achieve a new and genuine style expressive of, and appropriate to, the great new architectural problems which this scientific and commercial age has imposed upon architecture, the greatest of the creative arts?

FAILURES AND THE CAUSES

IT is evident, after a study of the exteriors of American apartment buildings in their architectural aspect, that the architect has failed to develop an appropriate design for the multiple-dwelling building. Again, there are two reasons for this obvious failure,—lack of rational appraisal of the problem, and the effect of speculative builder ownership.

The transition from the one-family to the multiple-family dwelling has altered many of the old social and family customs. Notwithstanding these radical changes, there has persisted a belief that the exterior and interior characteristic of the one-family dwelling should be incorporated in the apartment building. The architect has failed to appreciate the fact that an entirely new kind of design was required for an entirely new type of residence. What is the result? We find an attempt to apply the traditional features of the one-family dwelling or the palace to the multiple dwelling, regardless of its number of stories, shape, bulk, location and the altered sociological condition of the family. The apartment building is essentially a residential structure, but it is of such a specialized character that it requires a specialized treatment of its architectural design. Acknowledging the force of the tenant's preferences for certain architectural effects, it should be as easy to exploit the tenant's herd instinct in favor of the good as for the mediocre.

It was and is well within the architect's province to evolve and establish certain distinctive and appropriate modes and limitations for the design of this type of building. The method actually employed was to attach to the elevations and lobbies, with incomprehensible naïvete, fragments of one historical style or another, entirely disregarding the fact that these styles were developed exclusively for dwellings or palaces

of from one to four or five stories in height. The result is a lack of unity and clarity of design, involving a disproportion of inappropriate parts, —it could not be otherwise. The application of the traditional styles to the office building resulted in architectural mistakes that are now definitely recognized, and corrective measures are being employed by architects who understand function and character. The same process of intelligent thought must be used for the development of appropriate apartment house design.

By and large, the American apartment house in its architectural design is decidedly disappointing, especially when we realize the great importance of this type of building and the tremendous financial investments that it represents. Perhaps there is an extenuating circumstance applicable to the architect. It has been the policy of the ownership to concentrate on the rentable plan which is successfully developed. The architectural design is considered as secondary. If a building possessed pronounced renting qualities, however mediocre its architectural design, it was reproduced by the same or other owners because of the same herd instinct that characterizes the tenant.

In the opinion of the owner, the architect's only function is to produce a plan, with an elevation that is rentable and also acceptable to the building departments. Too often the owner resorts to the use of "free engineering" services provided by the various subcontractors. The architect is paid an inadequate remuneration which does not permit him to give a sufficient amount of his own time or to employ competent designers. It is a case of procuring the most, not the best, for the least money.

There are notable examples of appropriately designed apartment buildings found in every section of the country. They are the products of an understanding, cultured and appreciative ownership and of architects who have been adequately remunerated so as to enable them to render complete architectural service of the highest quality. A general improvement and eventual attainment of fine architectural designing of apartment buildings may result from the same causes that have produced the noticeable present-day improvement in office building design: greater competition for tenants; a more intelligent and cultured ownership; and, adequate remuneration for architects; more careful discrimination on the part of bankers in making loans.

The coöperative apartment building is a radical development in that the occupants are owners instead of tenants. An owner is more interested in the quality of the home than is a tenant and, perhaps, possesses more discrimination and knowledge. Owners of this type, at least, can afford to employ competent and adequately paid architectural service. The coöperative apartment building, because of its increasing excellence, may force an improvement in the architectural design of the tenant-occupied apartment building.

JUSTIFICATION

WHILE there are many architects who deplore the "poor architecture" of the usual apartment house, it can hardly be denied that the buildings as we see them are an expression of American taste and American custom. We know this because it has been tested and is being tested every day by renting agents. The public is given what experience shows it wants enough to pay for. If the taste in the city is raised to a level at which it thinks it appreciates the charm of old English houses, this is soon reflected by fake "half-timber" and meaningless gables applied to the apartment exterior. A building in one so-called style which rents successfully will be copied by the next speculative builder in the vicinity. The taste expressed is not necessarily the taste which would be shown in answer to a questionnaire, and yet it is the taste which the American public is backing up with its dollars and cents.

Until recently practically all the appartment houses were of a speculative nature. The coöperative apartment has to some extent changed this, and many architects of outstanding ability have designed buildings in this field. Those who are thinking of architecture as dealing with either beauty or function, or both, must certainly deplore the paucity of imagination or anything simulating real design in all apartment buildings (with but few notable exceptions), from the long, monotonous Florentine fronts on Park Avenue to the pseudo half-timber and semi-Spanish of the cheap "rows." Yet they are all expressions of taste. The tenant of the de luxe apartment feels that his home is in good taste if there is enough Italian detail and a few cartouches. Whether or not the detail is well placed or whether it is a mere arbitrary collection of ornament and motif makes no difference to him, and therefore makes no difference to the renting agent, and consequently to the architect who must turn out his drawings in the shortest possible time.

The architect is usually receiving too small a fee to justify a thorough study of the problem, so the plan is given the benefit of some cumulative renting experience (if not scientific analysis), and the exterior is ornamented rather than made an integral part of the design. Until architects can demonstrate the money value of plan analysis and studied design throughout, we can hardly hope for better apartment architecture.

THE NEW MULTIPLE DWELLING LAW OF NEW YORK

BY

ARTHUR GROSS

OF SCHWARTZ & GROSS, ARCHITECTS

IN commenting on the new Multiple Dwelling Law of New York, it is well to consider conditions which brought about its passage. Previous to 1909, tenements, as occupied in New York, were real tenements (as generally understood by the word); that is, such accommodations were the most crowded and unsanitary. The building code covered these buildings so far as construction was concerned, and the Health Department had sanitary regulations, but all in all these laws produced most unsatisfactory results. The present New York slums are largely the result of the insufficient regulation of these tenements.

In the year 1909 the Tenement House Law was passed, and from that time on the tenement house took on a different aspect. While there had been a few good "apartments" built before that time, they were a negligible number, but following this change in the law the advantages of well planned and well constructed tenements became evident. The change from the private dwelling to the multiple-family dwelling was brought about mainly through domestic and economic necessities, and before long we found the finest private homes abandoned for the most luxurious "tenements," as they were then classified.

During the latter years of the existence of the Tenement House Law there sprang up another form of multiple-family dwelling, the apartment hotel, commonly known as the "bootleg hotel." These hotels supplied housing in most cases of the best and most expensive character, but they did not fit the classification of the Tenement House

Wurts Bros.

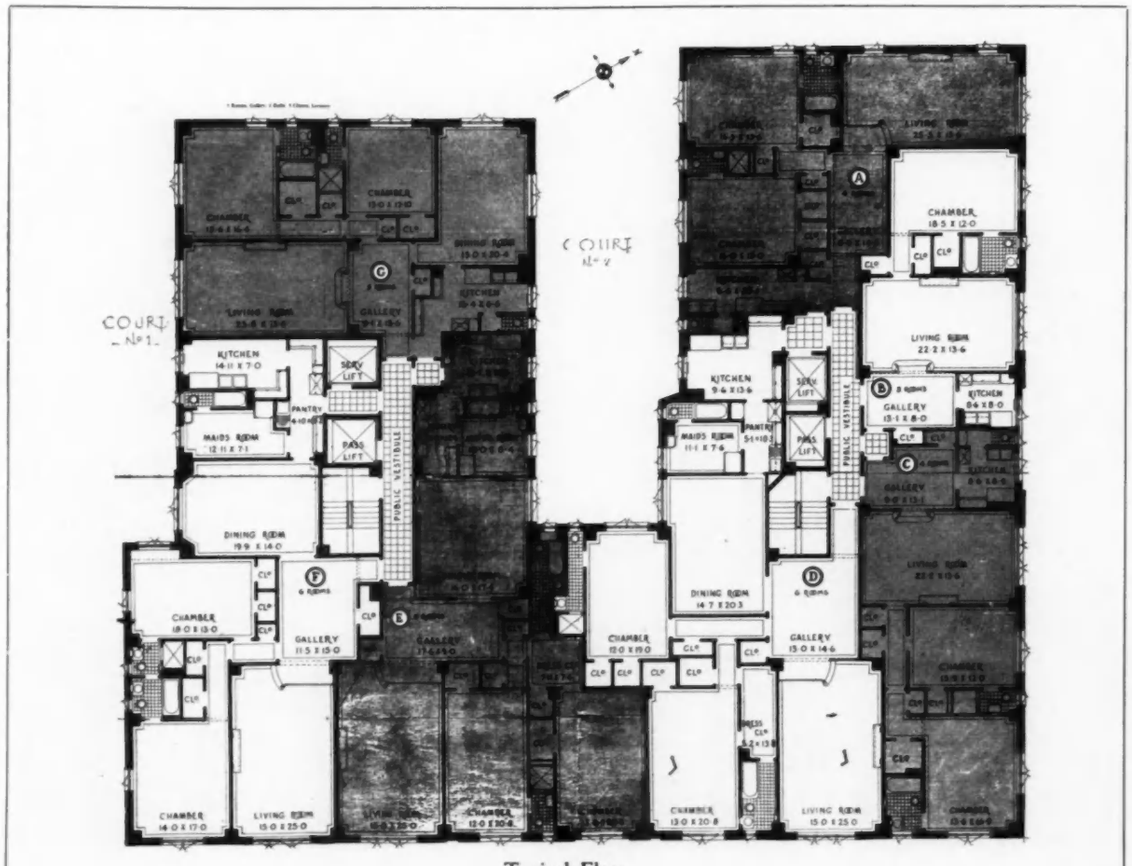
888 Park Avenue, New York
Schwartz & Gross, Architects

Wurts Bros.

885 Park Avenue, New York
Schwartz & Gross, Architects

S. W. Cor. 66th St. and Central Park West
Schwartz & Gross, Architects

Law. Many families of means who had country homes, who traveled a great deal, or who did not want to be bothered with the details of housekeeping, moved into these hotels, furnished their own apartments, did occasional cooking in the small serving pantries provided for the purpose, or took their meals in the restaurants within or outside the buildings. The Tenement House Law defined a tenement house "as the home or residence of three families or more, living independently of each other, and doing their cooking upon the premises." Since these people did not live independently of one another and did not do their cooking on the premises, but generally used the restaurants in the houses, these buildings were permitted, although recently the courts decided they were not within the law. These houses were built according to the local Zoning Law and were carried to a greater height, with smaller-sized yards and courts than tenement houses, so that where these buildings were built within a residence district much damage was done to the light and ventilation of adjoining tenements.

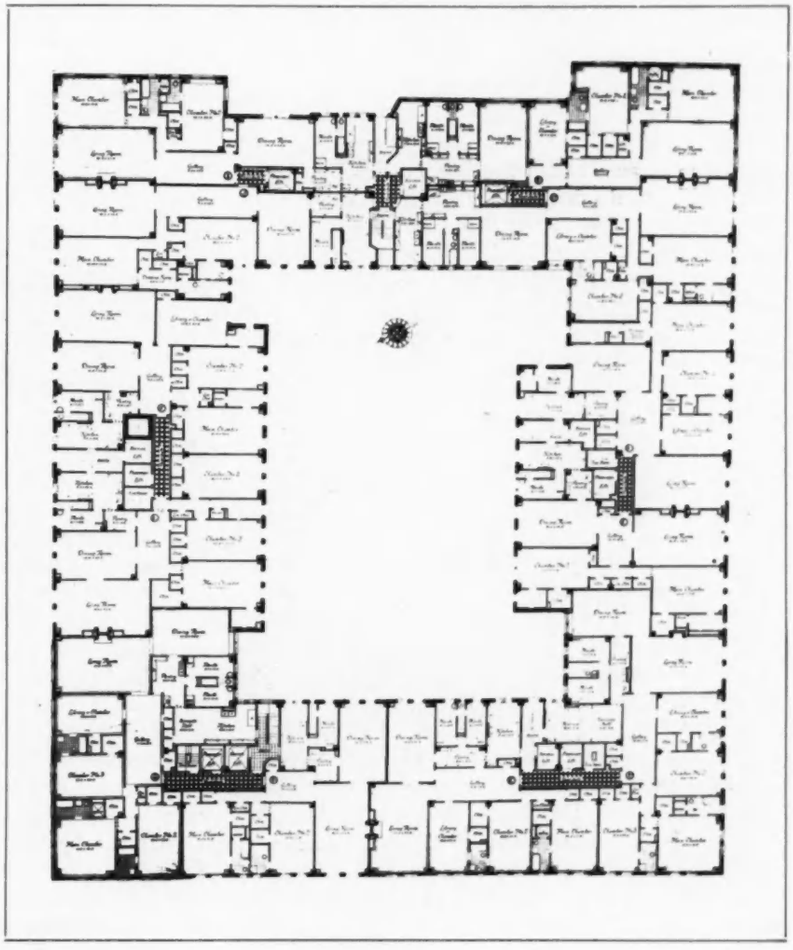


Typical Floor

Van Anda

Van Anda

(Upper Left) Interior Court and Driveway. (Upper Right) Perspective View of Park Avenue. (Right) Typical Floor Plan



1185 Park Avenue, New York
Schwartz & Gross, Architects

101 Central Park West, New York
Schwartz & Gross, Architects

After considerable agitation over a period of years, this matter was brought to a head in the legislature where finally the new Multiple Dwelling Law was passed which put these buildings within the scope of the Dwelling House Law. There were several points where these buildings had the advantage of the tenements, but the new Multiple Dwelling Law practically eliminates these and puts both the tenement and the hotel, that is, Class A (Tenements and Apartment Hotels) and Class B (Transient Hotels) Multiple Dwelling, on an equal footing as far as yards, courts, exits and most of the details are concerned, the one exception being that where a transient hotel is erected in a business block, the height and bulk are governed by the local Zoning Law and not by the Multiple Dwelling Law. If it were not for this exception it would hardly be possible (for commercial reasons) to erect a transient hotel on expensive land in the down town business districts of New York, as the limitation of bulk is too severe.

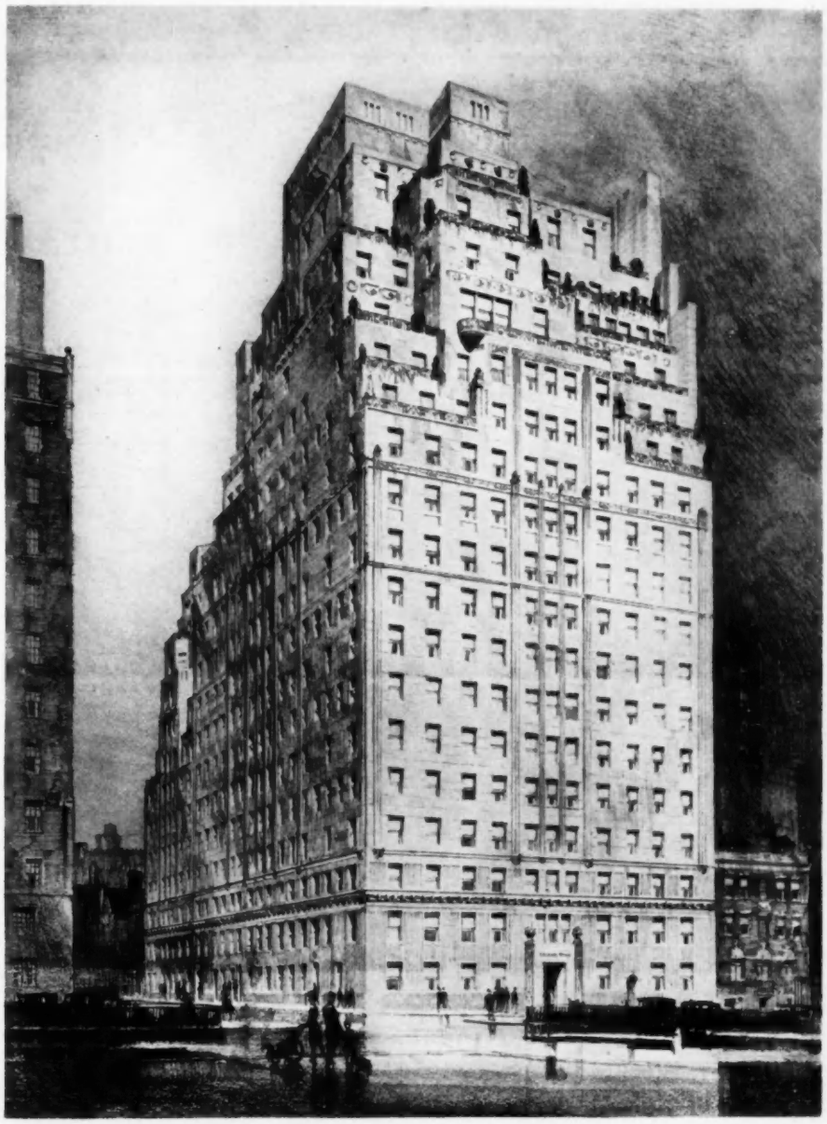
Comparing the Dwelling Law with the Tenement House Law, we find the changes in non-fireproof houses have not been very radical. Yards and courts generally have been increased, and stair requirements have been changed to comply with the number of rooms instead of the number of families, which somewhat eases the situation where many small apartments are built. The greater change has occurred in tall fireproof structures, and for a very good comparison I will cite two buildings planned by my firm, one completed last year under the Tenement Law and the other completed this year under the Multiple Dwelling Law located within a short distance of each other, and built for the same owners, and where the general requirements are about the same.

	69th Street & Central Park W. 15-Story Tenement House Law Plan	66th Street & Central Park W. 18-Story Multiple Dwelling Law Plan
Area of plot.....	16,052 sq. ft.	16,678 sq. ft.
Total cubic contents..	2,204,200 cu. ft.	2,395,800 cu. ft.
Number of rooms....	514	576
Number of apartments	91	116
Average net room size	219.5 sq. ft.	226.2 sq. ft.

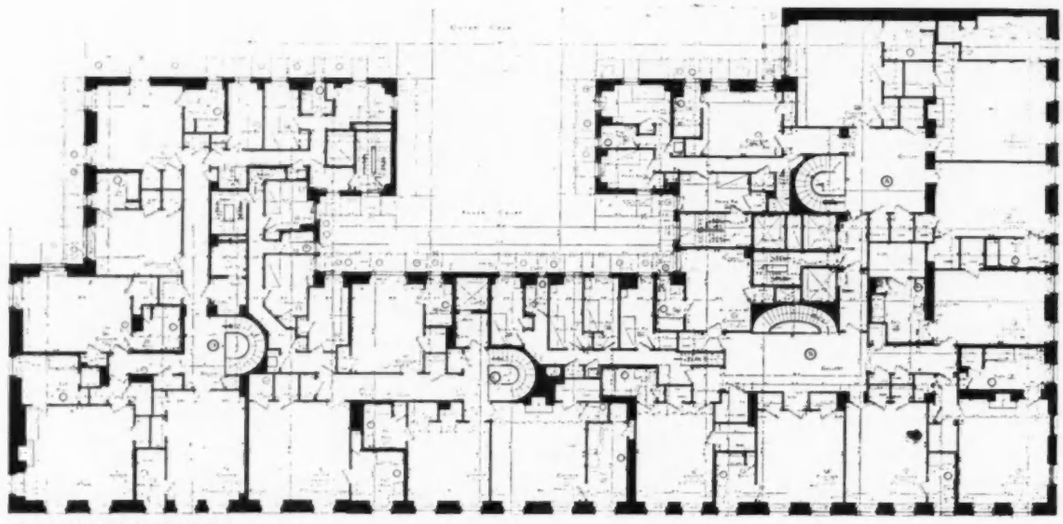
We find on the Tenement House Law plan the average coverage of lot from the first to the 15th floor is 77.9 per cent with a 40.3 per cent area in a pent house, giving an average of 75.5 per cent. We find on the Dwelling Law plan that the coverage from the first to the ninth floor is 75.2 per cent and then varies to 52.2 per cent on the 18th floor with 36.1 per cent for the pent house, making an average coverage of 68.2 per cent. The greater number of stories and economies in lighting the stair halls and public halls more than make up for the decrease in area per floor to allow for the greater number of rooms noted here. The rear and court walls of the building run up straight to the ninth floor, and above this floor the walls are set back in two-story units; the front walls run straight to the 15th floor and are similarly set back above the 15th floor in two-story units. The other Dwelling Law houses planned by our firm have shown rather small variation in the average coverage of lot, varying from 67.4 per cent to 72.2 per cent, the greater coverage being for the larger plots. I should say on a 60-foot street, inside lots less than 75 feet wide would be uneconomical, and on a 100-foot street inside lots of less than 100-foot frontage would be uneconomical if the house is built to the maximum allowed by law, one and three-quarters times width of street plus a 12-foot pent house. Corner lots, of course, can be somewhat smaller, but the small size lot suffers considerably through the Dwelling Law.

To the architect who is not familiar with the working of our New York laws governing multiple dwellings, some of the details of the plan may seem curious; in fact he may even say that they are clumsily planned, but when he has waded through our many laws governing these buildings he will understand the difficulties and the many "tricks" necessary to produce a livable and commercially successful multiple dwelling. I may give the reader some idea of this condition when I say that in order to build a multiple dwelling in New York it is generally necessary to secure 15 or 20 permits from many departments having jurisdiction. Add to this the requirements of economy of space, construction, and materials demanded by the builder, and some idea may be formed of the difficulties of the architect in designing and executing this highly commercial type of architecture.

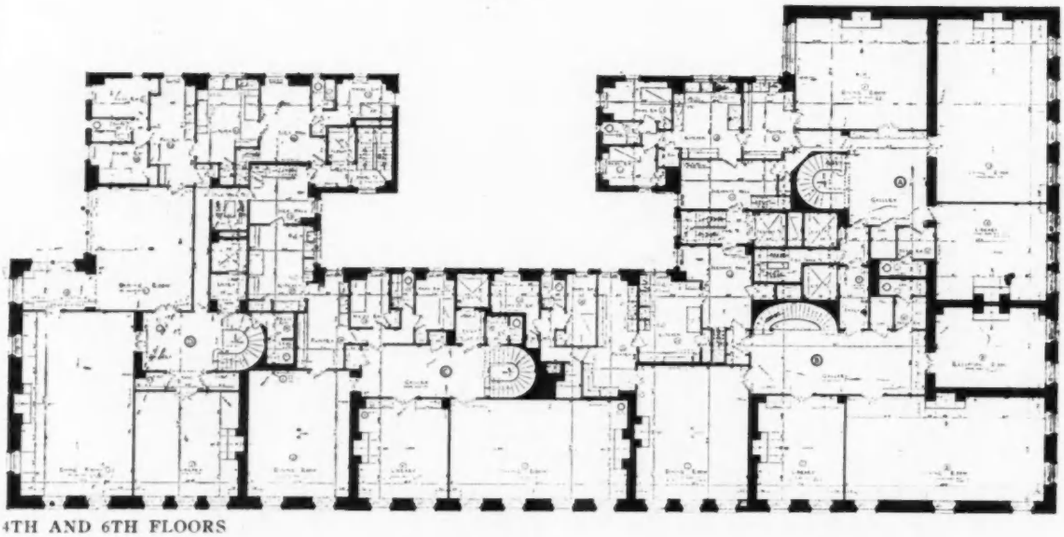
RECENT APARTMENT HOUSES IN NEW YORK



740 PARK AVENUE, NEW YORK.
ROSARIO CANDELA AND ARTHUR
LOOMIS HARMON, ARCHITECTS



5TH AND 7TH FLOORS

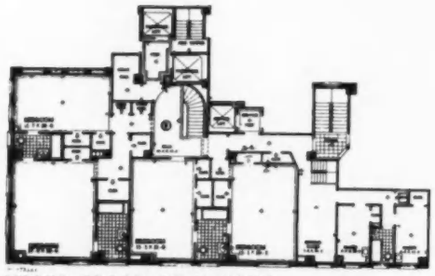


4TH AND 6TH FLOORS

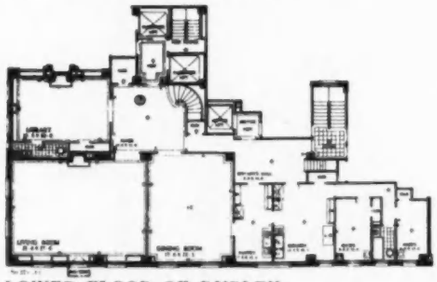
PRACTICALLY all of the apartments are duplex, with sizeable and well proportioned rooms, unusually well arranged for convenience and comfort. From the accompanying architects' sketch of the exterior, there is evident a conservative expression of contemporary freedom in architectural design. String and belt courses are used to delimit the principal parts of the facade, and not at all in a classical or traditional manner. The setbacks above the twelfth story suggest the varied arrangement of the several large and important apartments occupying the upper stories of the building. In these setbacks there is a pleasing variation in the size and arrangement of the various windows opening on the small garden terraces made possible by the different setbacks.

740 PARK AVENUE, NEW YORK.
ROSARIO CANDELA AND ARTHUR
LOOMIS HARMON, ARCHITECTS

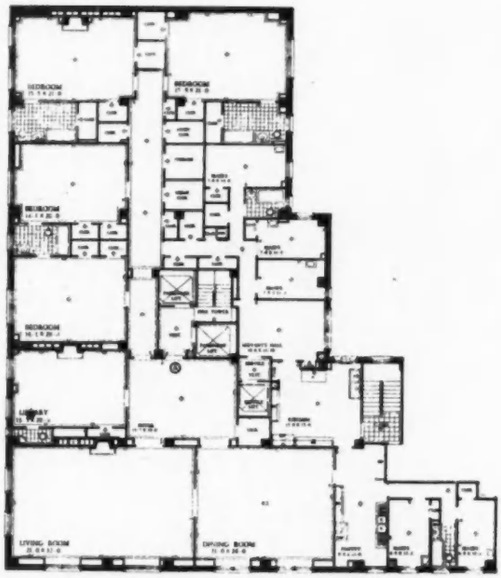
730 PARK AVENUE, NEW YORK.
F. BURRALL HOFFMAN, JR. AND
LAFAYETTE A. GOLDSTONE, ARCHITECTS



UPPER FLOOR OF DUPLEX
4TH, 6TH AND 8TH FLOORS



LOWER FLOOR OF DUPLEX
3RD, 5TH AND 7TH FLOORS

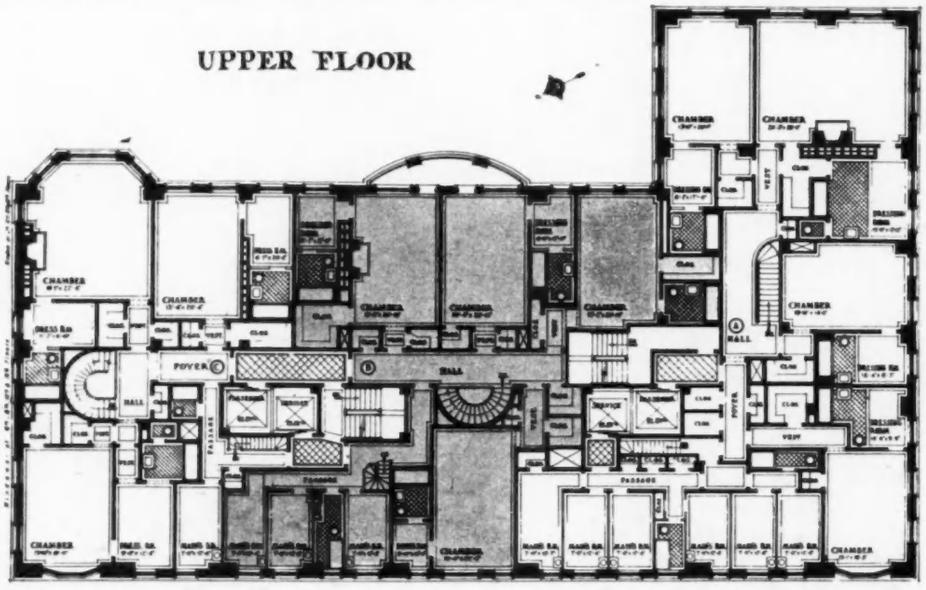


TYPICAL APARTMENT
9TH, 11TH AND 13TH FLOORS

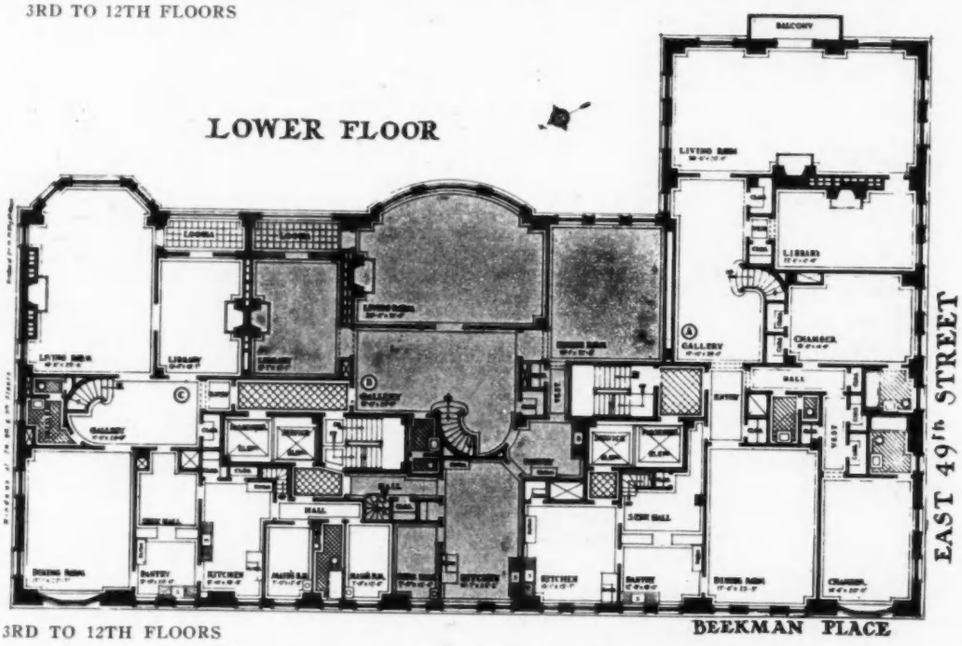
THE exterior design shows a legitimate simplicity appropriate to a building erected as an investment proposition. Above a two-story stone basement, the next eleven stories show a plain brick wall surface broken by windows, some of which differ in size and arrangement. This variation in the windows gives a pleasing character to the design and obviates the usual monotony of window arrangement and size found in most apartment-house designs. Above the thirteenth story the setbacks, with the exception of the five-story gables which serve as finials to the street facade, are varied in size and design, piling up one above the other in picturesque irregularity. It is evident from this design that the Dwelling Act is bringing about as great a change in the exterior design of apartment houses as the Zoning Law of several years ago produced in the architectural appearance of office buildings. These two New York laws which are exercising such tremendous effect upon office building and apartment house design in New York, are already being adopted either as a whole or in part in many of the other large cities in this country. So the result during the next few years may presage consistent architectural development throughout the entire United States.

730 PARK AVENUE, NEW YORK.
F. BURRALL HOFFMAN, JR. AND
LAFAYETTE A. GOLDSTONE, ARCHITECTS

ONE BEEKMAN PLACE, NEW YORK.
SLOAN & ROBERTSON, ARCHITECTS



3RD TO 12TH FLOORS



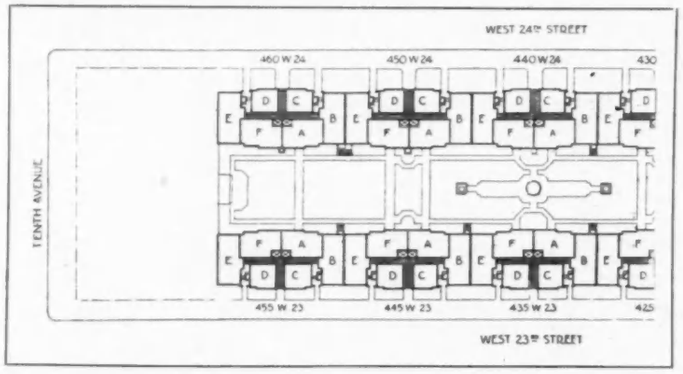
3RD TO 12TH FLOORS

IT is hardly fair to criticize the design of any building from preliminary sketches because almost always the completed building varies considerably in design from the architect's early conception. However, this sketch quite accurately suggests the appearance of the building as it will look when completed. In this design there is a pleasing simplicity. The size and the grouping of the windows break the plain wall surfaces in a balanced arrangement. In the treatment of the entrance door and the two stories above it, as well as of the façade of the upper setbacks, a simple decorative treatment has been carried out, obviating any possible monotony. The typical floor plans of the three duplex apartments show the principal living rooms are overhanging the East River.

ONE BEEKMAN PLACE, NEW YORK.
SLOAN & ROBERTSON, ARCHITECTS

Van Anda

LONDON TERRACE, NEW YORK. FARRAR & WATMOUGH, ARCHITECTS

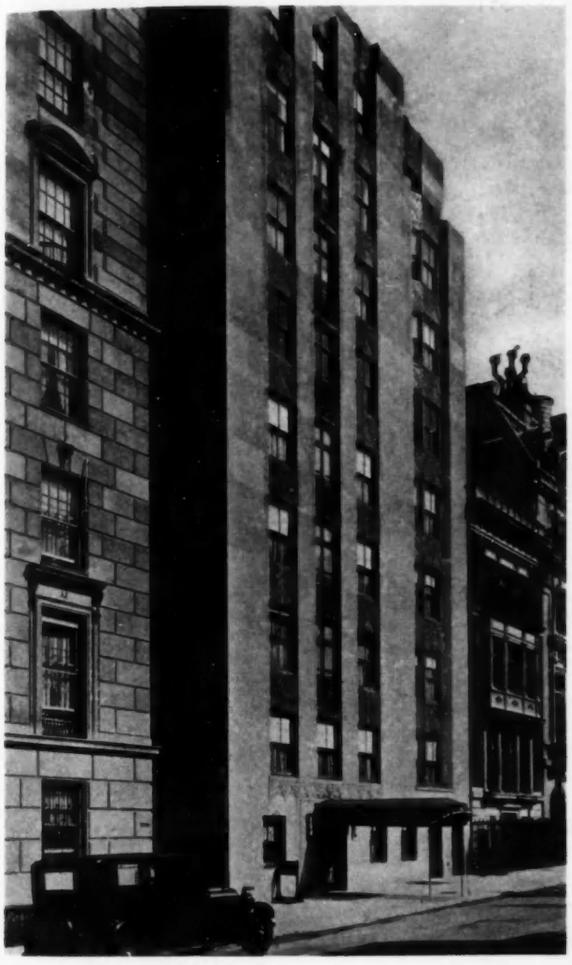


AS these buildings were designed and accepted by the Building Department before the Multiple Dwelling Act went into effect, no setbacks above the twelfth story were required. Therefore, sixteen stories rise formidably from the building line. It seems unfortunate that the famous London Terrace of old times should be replaced by a group of apartment houses in which financial return has necessitated the erection of such tremendous buildings, suggesting in no way the quiet charm and dignified refinement of the Greek Revival style which distinguished the original London Terrace. It might have been an interesting and successful experiment to design this great unbroken group of apartment houses in a style suggestive of the Neo-Grec period in American architecture.

COST AND CONSTRUCTION DATA

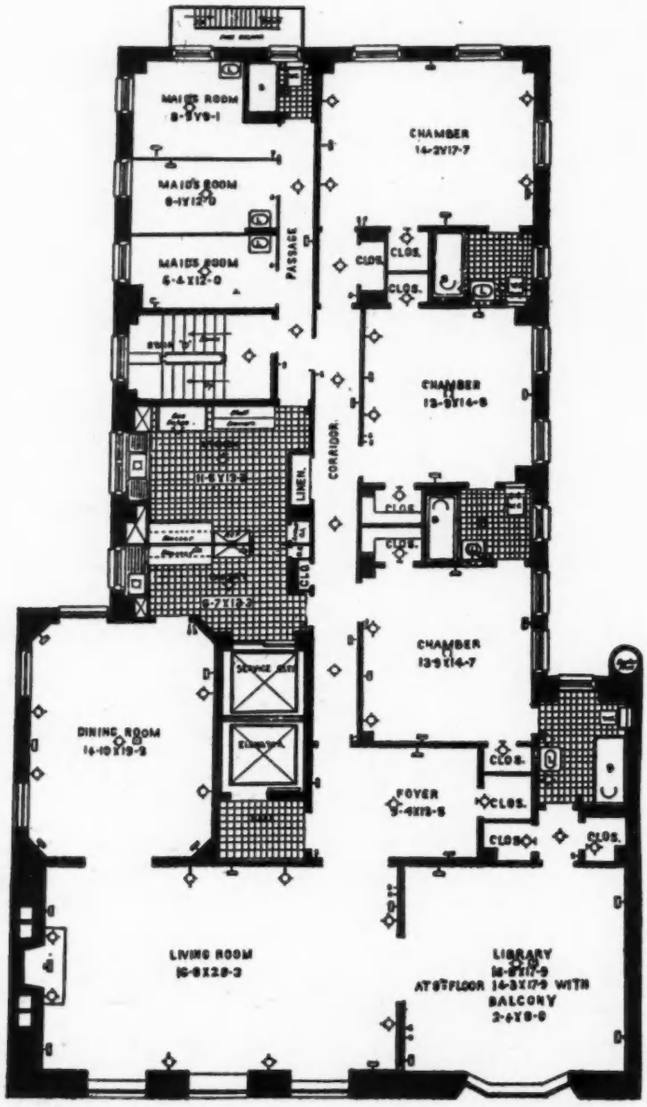
Date of Completion: 10 units, Summer 1930; Avenue buildings, early 1931.
Total Number of Apartments: 1671.
Total Number of Apartments per Floor: 106 typical.
Total Number of Rooms per Apartment: 1-8.
Structural Frame: Steel.
Structural Floor System: Cinder concrete with mesh reinforcing.
Heating: Vapor vacuum.
Ventilating: Mechanical.
Elevators: 28 passenger, 2 service.
Lighting: Rigid conduit.
Plumbing: Soil pipe, cast iron, brass hot and cold.
Windows: Steel casements.
Trim: Metal.
Cubical Contents: 16,821,000 ft.
Total Cost: Valuation, $20,000,000.

LONDON TERRACE, NEW YORK.
FARRAR & WATMOUGH, ARCHITECTS



3 EAST 84TH STREET, NEW YORK.
JOHN M. HOWELLS—RAYMOND M. HOOD, ASSOCIATED, ARCHITECTS

Gottscho

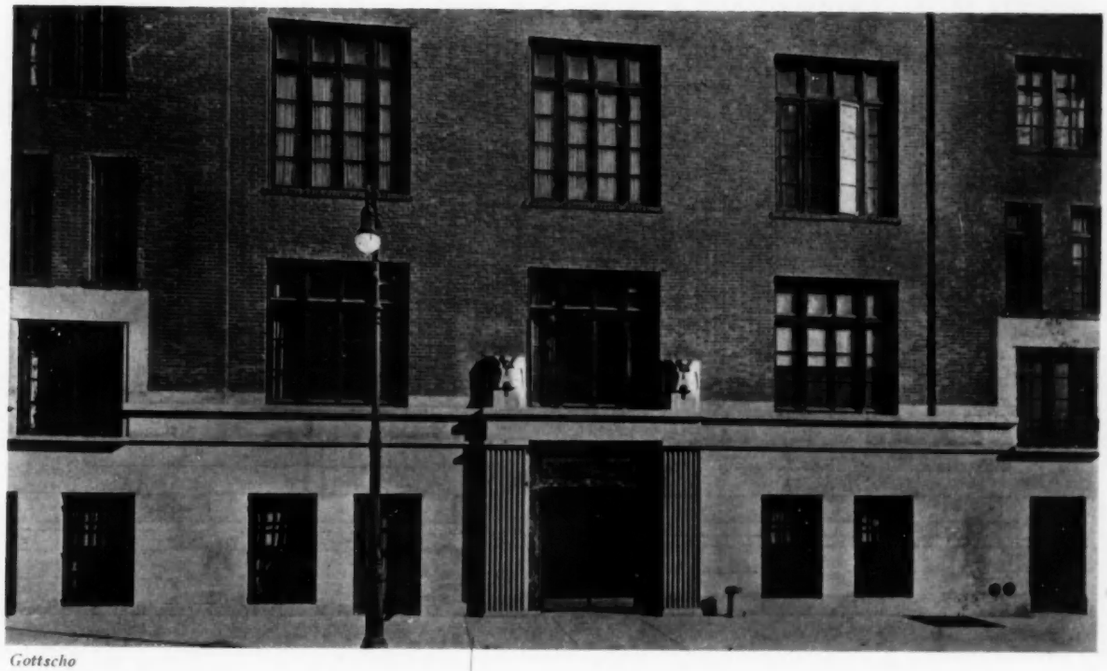


TYPICAL FLOOR

FOR a small apartment house on a side street this building is pleasingly simple and straightforward in design. What little architectural decoration there is has been used in the spandrels below the windows. These have a geometrical design typical of the contemporary style. The accompanying plan shows a typical one floor apartment layout. The arrangement and location of the various rooms could hardly be improved upon. The location of the kitchen and pantry in relation to the service elevator floor and service stairs is excellent. One of the most difficult problems in laying out a one floor apartment is the proper location of the service end of the establishment.

3 EAST 84TH STREET, NEW YORK.
JOHN M. HOWELLS—RAYMOND M. HOOD,
ASSOCIATED ARCHITECTS

169 EAST 78TH STREET, NEW YORK.
ROBERT P. RODGERS AND
ALFRED E. POOR, ARCHITECTS



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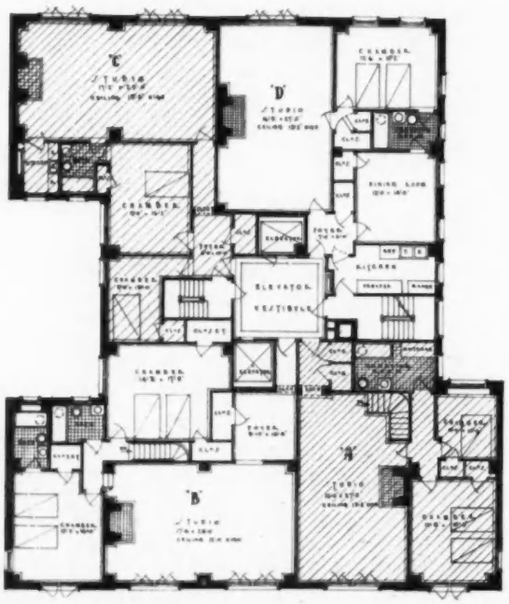
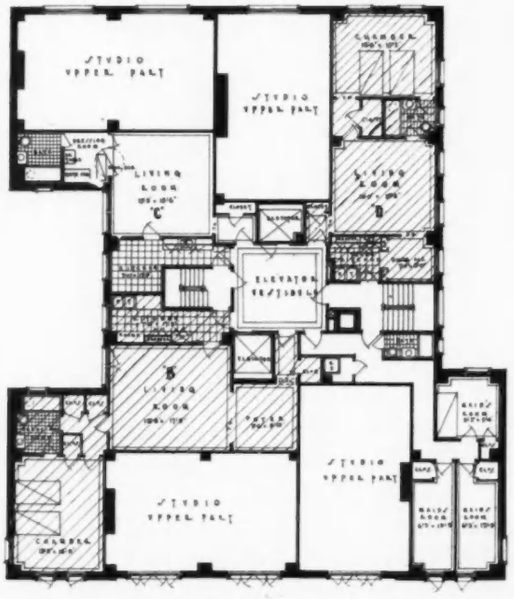


SECOND FLOOR



THIRD AND SIXTH FLOORS

COST AND CONSTRUCTION DATA

Date of Completion: September, 1928.
Total Number of Apartments: 35
Total Number of Apartments Per Floor: Varies.
Total Number of Rooms Per Apartment: 1, 9-room; 1, 8-room; 16, 3-room; 3, 2-room; 3, 6-room; 10, 4-room.
Structural Frame: Steel.
Structural Floor System: Concrete floor slab. Studio floors soundproofed.
Heating: Steam.
Lighting: Direct electric from side brackets.
Radiators: Concealed in studios.
Plumbing: Showers over bathtubs.
Windows: Wood casement.
Trim: Steel.
Cubical Contents: 603,271 cu. ft.
Cubic Foot Cost: 85 cents.
Total Cost: $518,525.36.

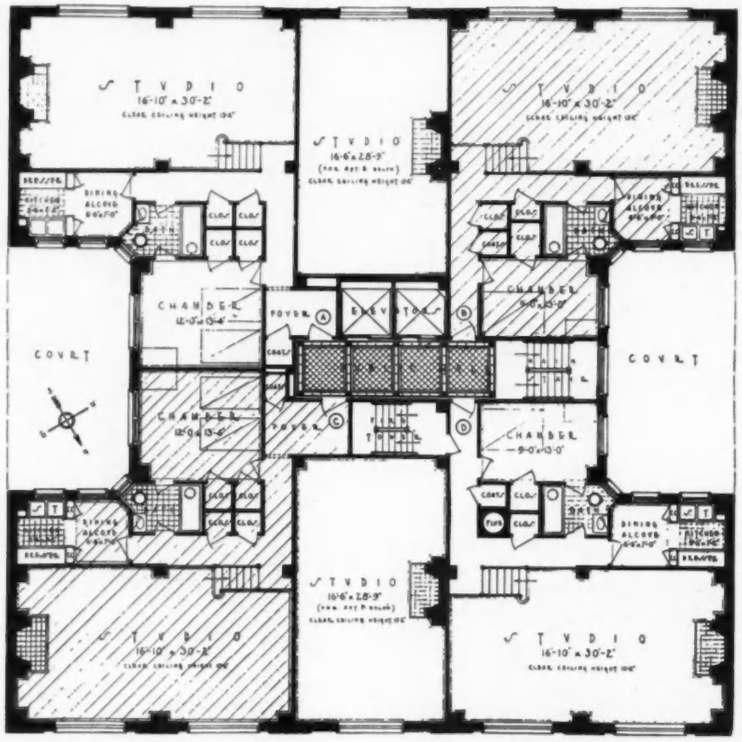
JUSTIFIABLE simplicity marks the design of this recently completed studio apartment house. Although this building occupies a plot of land almost equal in size to the apartment house by the same architects across the street, it is smaller on account of grouping together the three large windows of the studios on each floor. The small windows at each side, alternating in size and shape, give the effect of balancing piers, which break up the facade in a successful manner. The low studded bedrooms and dining rooms are cleverly dove-tailed in with the high-studded studios. There are four studio apartments on each of the six principal floors, the arrangement of which shows ingenious and thoughtful planning.

169 EAST 78TH STREET, NEW YORK.
ROBERT P. RODGERS AND ALFRED E. POOR, ARCHITECTS

Gottscho

Gillies

170 EAST 78TH STREET, NEW YORK.
ROBERT P. RODGERS AND
ALFRED E. POOR, ARCHITECTS



THIRD FLOOR

COST AND CONSTRUCTION DATA

Date of Completion: December, 1927.
Total Number of Apartments: 33.
Total Number of Apartments per Floor: Varies as some are duplex, others simplex.
Total Number of Rooms per Apartment: 2, 9-room; 1, 8-room; 2, 6-room; 6, 5-room; 7, 4-room; 15, 3-room.
Structural Frame: Steel.
Structural Floor System: Concrete floor slab. Studio floors soundproofed.
Heating: Steam.
Lighting: Direct electric from side brackets.
Radiators: Concealed in studios.
Plumbing: Showers over bathtubs.
Windows: Steel casement.
Trim: Steel.
Cubical Contents: 648,000 ft.
Cubic Foot Cost: 77 cents.
Total Cost: $507,571.06.

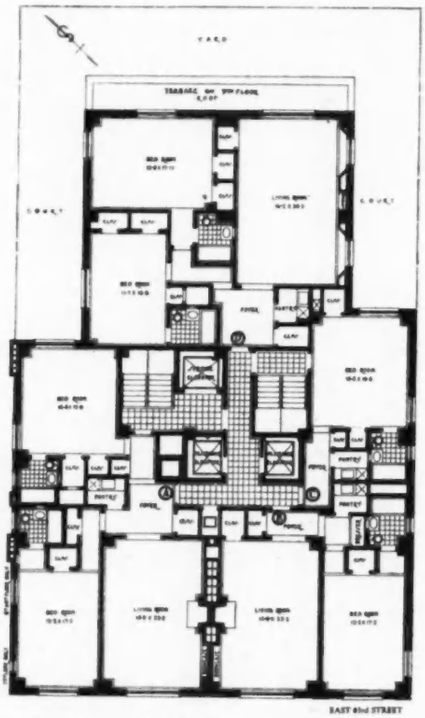
CRITICISM

SIMPLICITY bordering on austerity is here evident. The building looks thoroughly practical and utilitarian. All of the wall space possible, between the unbroken brick piers, is occupied by windows equal in width but varying in height. Were it not for the applied Neo-Grec decoration above the entrance motif, and the original iron lamp posts on either side of it, the severity of this design would suggest a loft rather than a studio building. But here again it must be remembered that studio as well as apartment buildings are erected as financial investments, so the minimum of architectural ornamentation and decoration is advisable. In the plan the arrangement of the six studios on each of the six principal floors is excellent. Buildings of this type, where high studded studio rooms are combined with low studded bedrooms and dining rooms, require great ingenuity in successfully and economically fitting together the various parts of the plan.

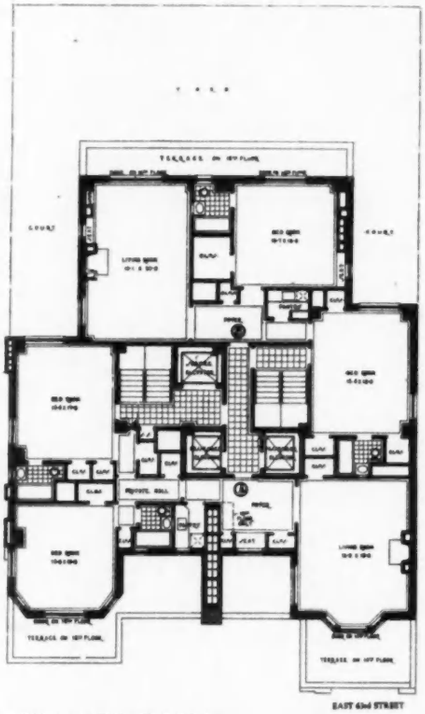
170 EAST 78TH STREET, NEW YORK.
ROBERT P. RODGERS AND
ALFRED E. POOR, ARCHITECTS

28 EAST 63RD STREET, NEW YORK.
HENRY S. CHURCHILL, ARCHITECT.
HERBERT LIPPMANN, ASSOCIATED

Van Anda



7TH TO 9TH FLOORS



14TH to 16TH FLOORS

COST AND CONSTRUCTION DATA

Year of Completion: 1927.

Total Number of Apartments: 45, 138 rooms.

Total Number of Apartments per Floor: Varies.

Total Number of Rooms per Apartment: Ones, twos, threes, fours, fives, sixes.

Structural Frame: Steel.

Structural Floor System: Cinder arch.

Heating: Steam.

Elevators: Two passenger, one service.

Windows: Steel casement.

Trim: Metal.

Cubical Contents: About 978,000 ft.

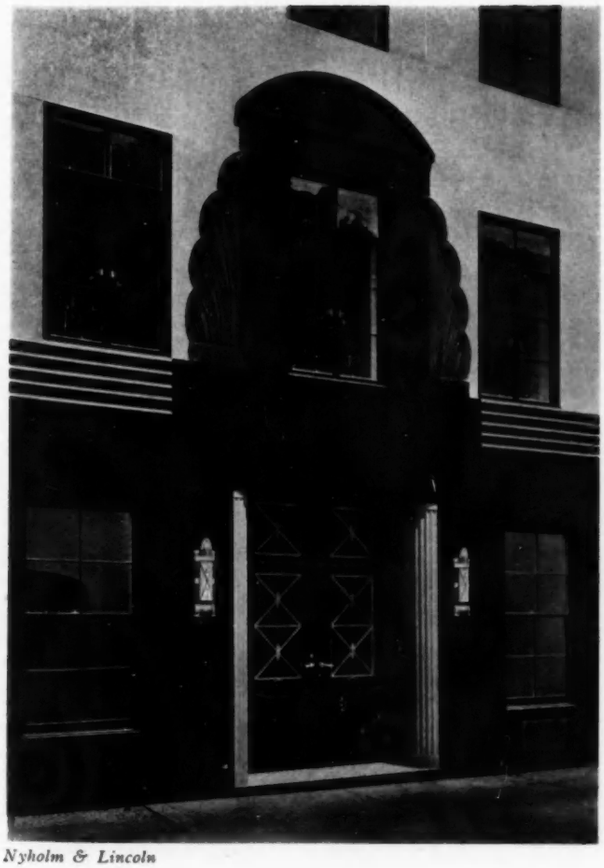
Cubic Foot Cost: 75 cents.

CRITICISM

THIS apartment is unusually interesting and successful in plan and elevation. The apartment was built three years before the Multiple Dwelling Law was enacted. Above the ninth story there are eight stories of setbacks. Each one of the three apartments on each floor has a pantry of sufficient size to permit its use as a kitchenette, a very popular plan feature. The color of the terra cotta and brickwork, as well as the method of laying the brick, gives the design of this building a pleasing individuality. The color of the terra cotta of the basement story contrasts and harmonizes in an artistic and successful manner with the color of the brick walls above. An excellent feature in the design of this building is the unusual width of the openings.

28 EAST 63RD STREET, NEW YORK.
HENRY S. CHURCHILL, ARCHITECT.
HERBERT LIPPMANN, ASSOCIATED

21 EAST 79TH STREET, NEW YORK.
VAN WART & WEIN AND BREED,
FULLER & DICK, ASSOCIATED, ARCHITECTS



Nyholm & Lincoln

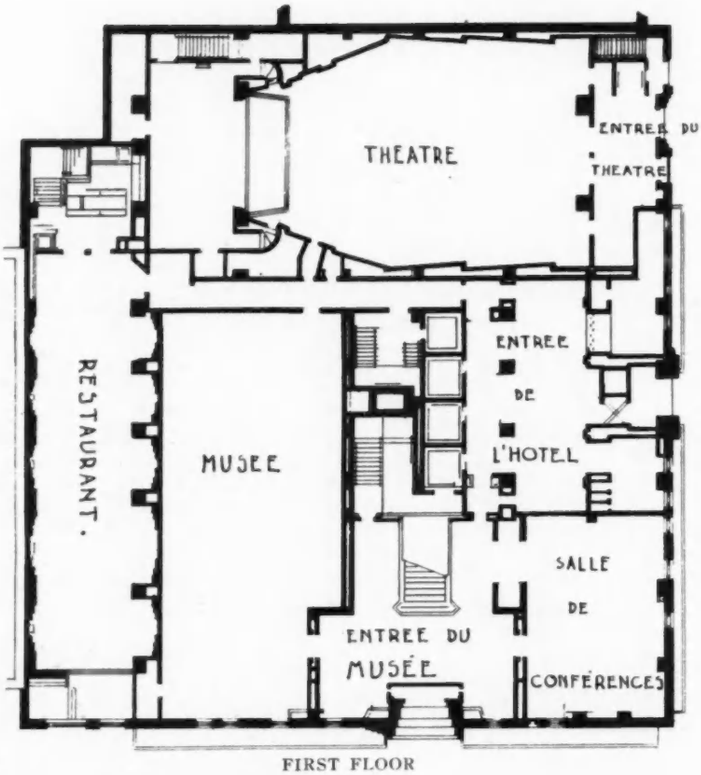
TYPICAL FLOOR

TO find a plain and unadorned façade for a mid-block apartment house is a welcome experience. To give solidity to the base of the building, as well as a little architectural decoration within the visual range of the spectator, black marble and an ornamental entrance door have been used. Freedom and originality in architectural expression is evident. From a careful study of the emphasis of the entrance door and the center window above, it would appear perhaps the heavy enframement of this window too closely crowds upon the windows on each side. The severity of the design as a whole might have permitted the black marble of the basement story to have continued unbroken across the lower part of the façade. A heavy reed moulding acts as a belt course above the third story and at the top of the building. Below is an iron railing of delicate design. This makes a decorative note as the crowning feature. Each of the twelve floors contains a single apartment, one of which is shown in the plan above. The principal rooms are logically located on the front of the building which faces south. The arrangement is compact and convenient with the four bedrooms well shut off from the living part of the apartment, as is also the case with the service end which occupies one corner of the plan. The sizes of the several principal rooms vary according to their importance and their use.

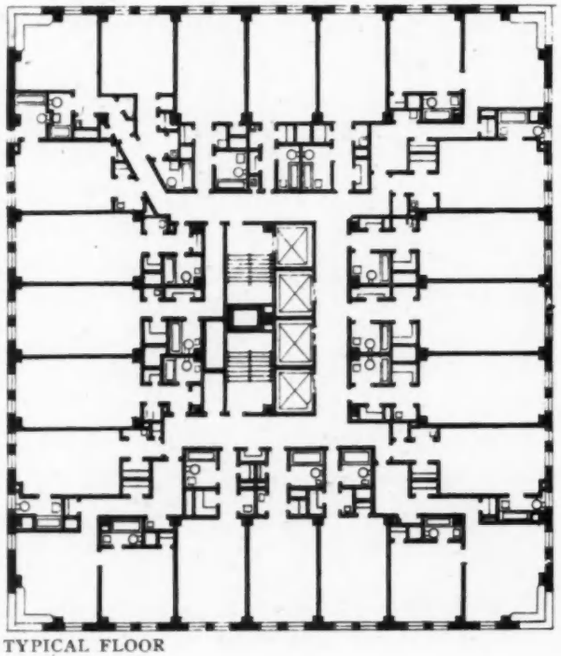
21 EAST 79TH STREET, NEW YORK.
VAN WART & WEIN AND BREED,
FULLER & DICK, ASSOCIATED ARCHITECTS

Palmer Shannon

THE ROERICH MUSEUM, NEW YORK.
HELMLE, CORBETT & HARRISON, ARCHITECTS



FIRST FLOOR

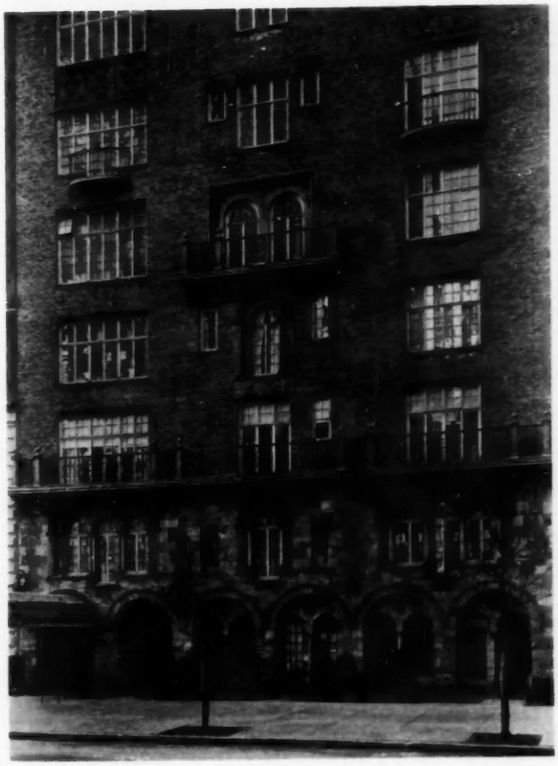


TYPICAL FLOOR

THE line of difference between the apartment house and the apartment hotel is sometimes difficult to define. As a combination of a museum, a school of fine arts and the drama, and a multiple dwelling building, this structure has no parallel. In exterior design as well as in plan, its straightforward simplicity and balance of design is noteworthy. The use of corner windows up to the first setback gives an individual character to the design. Structurally, the use of corner windows does not strengthen the effect of the corners of the building but adds much to the interior light and cheerfulness of the corner rooms. Open on all four sides, the plan of the apartment floors shows the elevators, stairways and bathrooms logically located in the center of the building. The strong, vertical feeling produced by broad and narrow brick piers extending all the way up to the setback floors gives dignity and consistency to the exterior design. Even the proportions of the entrance door repeat and accent this vertical feeling. The color of the brickwork ranges from dark red at the ground to light at the top.

ROERICH MUSEUM, NEW YORK.
HELMLE, CORBETT & HARRISON, ARCHITECTS

160 EAST 72ND STREET, NEW YORK.
TAYLOR AND LEVI, ARCHITECTS.
KENNETH M. MURCHISON, CONSULTANT



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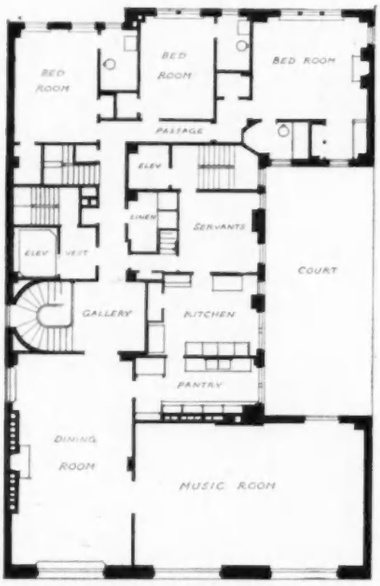
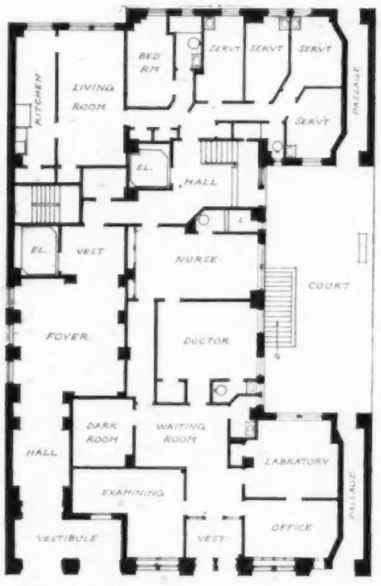


11TH AND 13TH FLOORS

12TH AND 14TH FLOORS



1ST FLOOR

CRITICISM

AN interesting solution of an unusual apartment house problem is found in this mid-block building designed for the occupancy of an individual and some of his friends. The exterior design shows a more informal, although balanced, use of Italian Romanesque detail. Especially in the two lower stories is this expression evidenced. The several floors are laid out as duplex apartments with sizeable rooms for living and entertaining. Each apartment has master bedrooms on the south side of each of the floors. On the top floor are located a squash court, studio, dressing rooms and play room belonging to the owner of the building. There is an individuality in the design of this building which almost places it in the private residential class.

COST AND CONSTRUCTION DATA

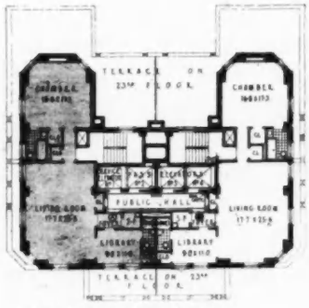
Date of Completion: October, 1928.
Total Number of Apartments: 14 in all; 6, 2 to a floor; 6, 1 to a floor; 1 duplex; 1 triplex.
Structural Frame: Steel skeleton construction.
Structural Floor System: Cinder concrete.
Heating: Modulation vapor system.
Ventilating: Individual fans in kitchens.
Elevators: Traction, manually operated.
Lighting: Direct.
Radiators: Cast iron.
Plumbing: Brass water pipe.
Windows: Steel casements entire front and part of rear; double-hung for others.
Trim: Wood.
Cubical Contents: 712,500 ft.
Cubic Foot Cost: 64½ cents.
Total Cost: $460,000.

160 EAST 72ND STREET, NEW YORK.
TAYLOR AND LEVI, ARCHITECTS.
KENNETH M. MURCHISON, CONSULTANT

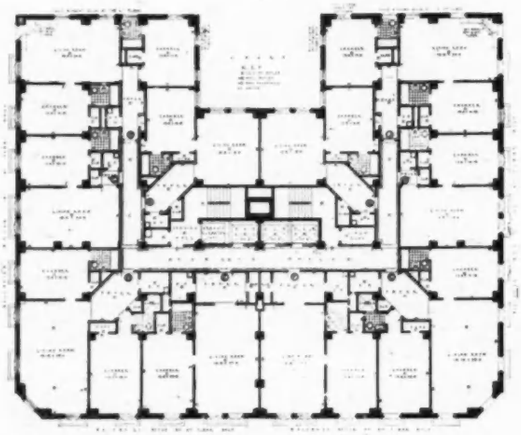
Brown Bros.

ONE FIFTH AVENUE, NEW YORK.
HELMLE, CORBETT & HARRISON,
SUGARMAN & BERGER, ARCHITECTS

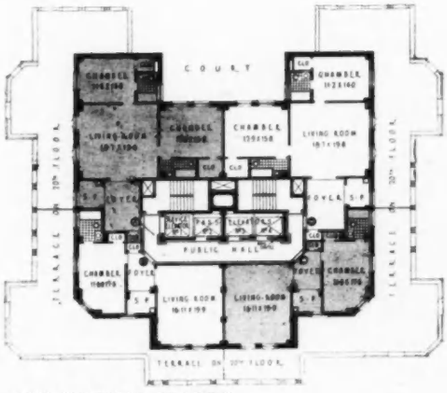
18TH TO 19TH FLOORS



23RD TO 27TH FLOORS



3RD TO 15TH FLOORS



20TH TO 22ND FLOORS

AS in the case of the Roerich Museum Apartment Building designed by the same architects, One Fifth Avenue is a combination apartment house and apartment hotel. Practically every apartment has a large closet containing an electric ice box and electric connections for cooking use. The elevators and service stairways as usual occupy the center of the rectangular plan. The setbacks necessitate smaller rooms but provide outside terrace facilities. The design is symmetrical and free. Again emphasis has been laid on the vertical lines of the building by using light and dark brick simulating shadows. Strength has been added to the design by cutting off the corners and carrying them up one story above the first setback in a turret effect. Above the 16th story the several setbacks form a strong base to the towering central shaft of the design. This in turn is crowned by a picturesque arrangement of pent houses and chimney stack. The building as a whole has solidity and dignity.

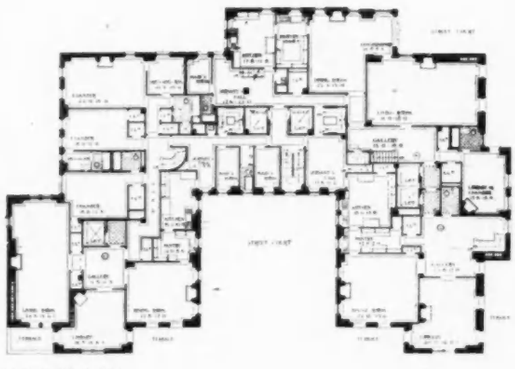
ONE FIFTH AVENUE, NEW YORK.
HELMLE, CORBETT & HARRISON,
SUGARMAN & BERGER, ARCHITECTS

895 PARK AVENUE, NEW YORK.
SLOAN & ROBERTSON, ARCHITECTS

3RD, 5TH, 7TH, 9TH, 11TH AND 13TH FLOORS

17TH FLOOR

2ND, 4TH, 6TH, 8TH, 10TH AND 12TH FLOORS



16TH FLOOR

CONSTRUCTION DATA

Total Number of Apartments: 35 suites in simplex, duplex and triplex arrangements of 12 to 15 rooms.

Heating: Two pipe low pressure vacuum steam system.

Ventilating: Mechanical in kitchens and interior bathrooms.

Elevators: Three passenger, two service.

Lighting: Electric.

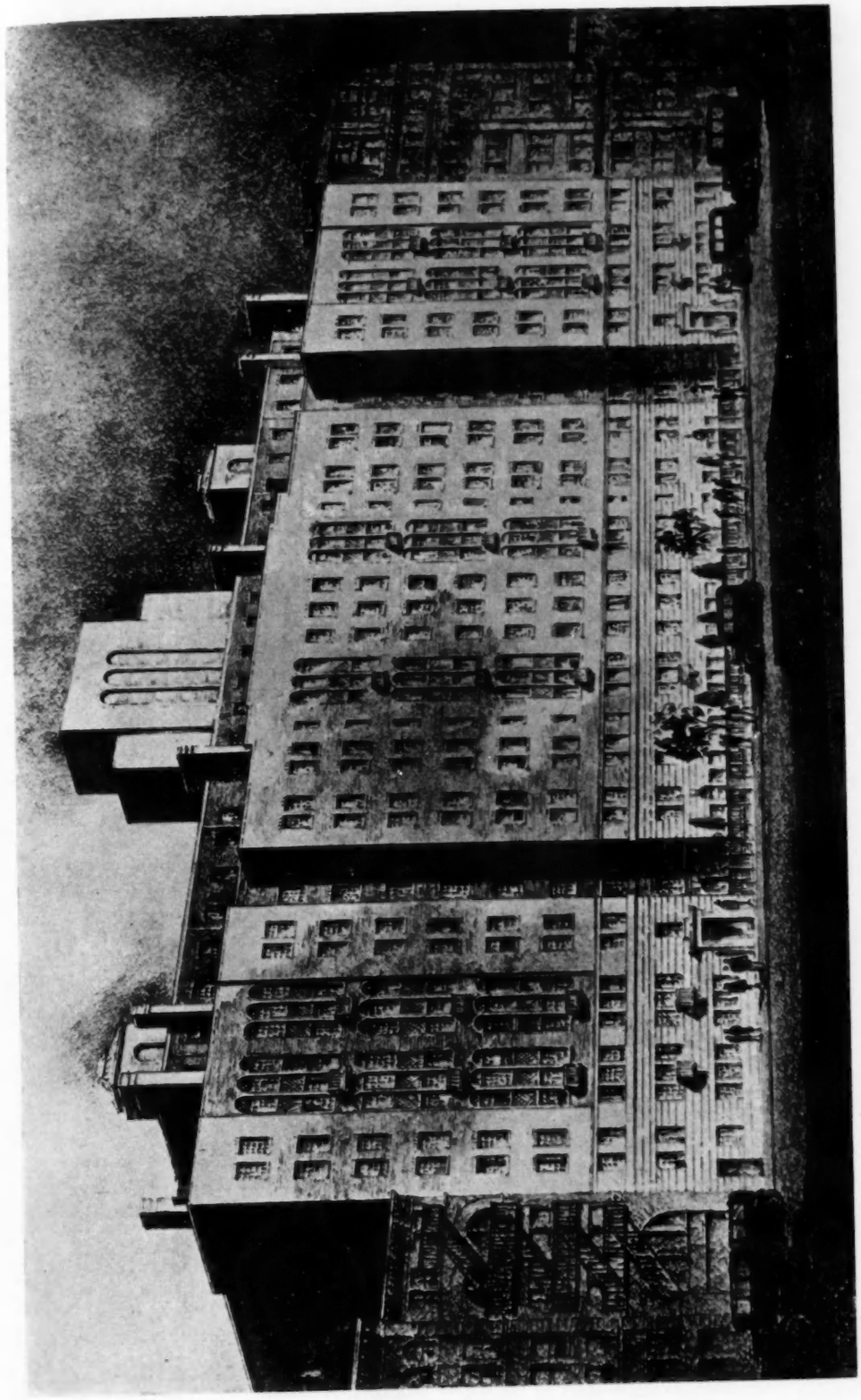
Radiators: Recessed within walls and enclosed.

Plumbing: Cast iron for main soil and waste lines; copper bearing steel for inside leaders; brass for both hot and cold water supply pipes.

Windows: Wood and metal, double hung.

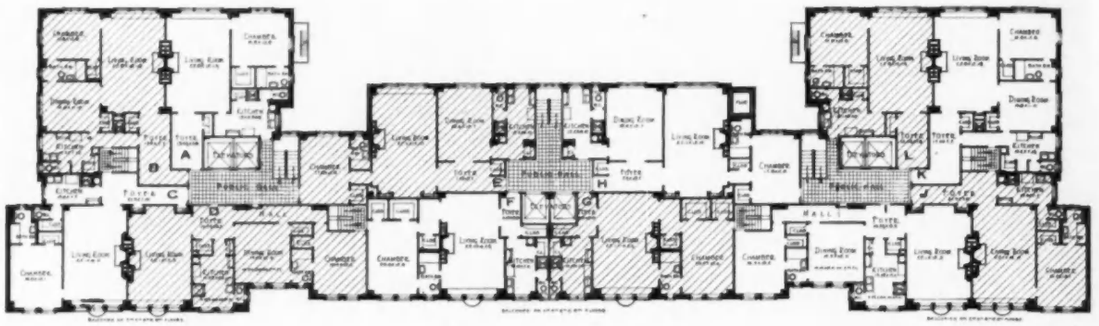
THE design as a whole is dignified, simple and straightforward. Above three lower stories of stone tower nine stories of brick walls, relieved by broad vertical bands of brick work and the doubling of the center windows. The delightful simplicity of the design as a whole particularly evidenced in the severe but balanced setbacks of the upper stories is not improved by the modernized type of cornice introduced above the twelfth story. The setbacks above the thirteenth story make a sufficient break and change in the design to obviate the necessity of so sharp and heavy a horizontal line. On the upper floors the de luxe apartments have some rooms of tremendous size. As the top apartments are always the highest priced as well as the most desirable from the point of view of light and air, it is practical as well as desirable to include at least one great room for entertaining purposes in each apartment.

895 PARK AVENUE, NEW YORK.
SLOAN & ROBERTSON, ARCHITECTS

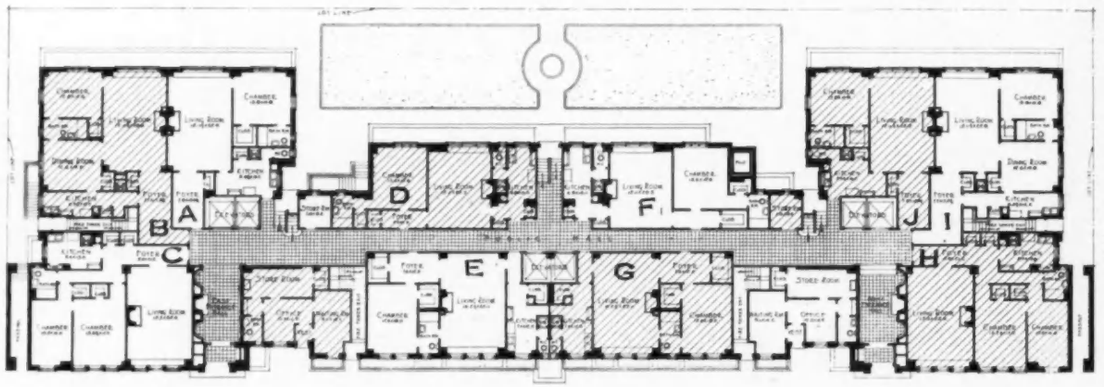


Brown Bros.

40-50 EAST 10TH STREET, NEW YORK.
HELMLE, CORBETT & HARRISON, ARCHITECTS



TYPICAL FLOOR



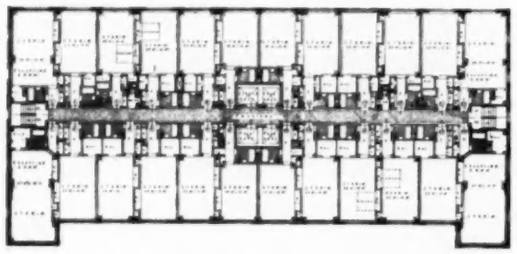
FIRST FLOOR

IN exterior design the deep breaks which divide the façade into three different parts are fortunate. Also the restriction of the main façade to nine stories adds much to the pleasing quality of the design. A general freedom of expression is also evident in the use of triple windows which give emphasis at certain points on the façade. The emphasis of the horizontal lines still further helps to reduce the apparent height. The straightforward simplicity of the design requires no ornamental crowning feature. In plan, the layout is excellent. By setting the building back from the rear lot and still further recessing the center portion of the structure a small open space which may have a fenced-in garden was made possible. Every apartment has a kitchen of adequate size and some of the larger apartments include a dining room. Today in moderate priced apartments of a living room, kitchen and two bedrooms, dining rooms are seldom considered necessary. As they are rooms used only three times a day for usually less than an hour at a time it seems more economical to throw this dining space into the general living room which may especially be used for dining as well as living purposes.

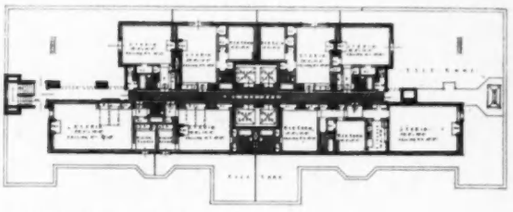
40-50 EAST 10TH STREET, NEW YORK.
HELMLE, CORBETT & HARRISON, ARCHITECTS

Duryea

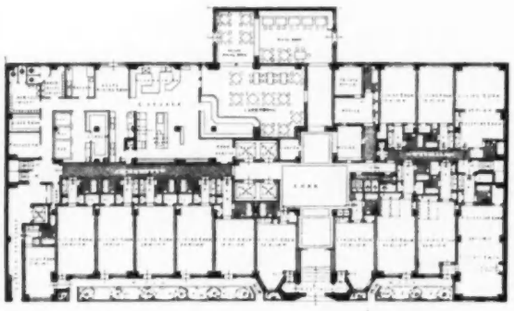
BEAUX ARTS APARTMENTS, NEW YORK. THE FIRM OF KENNETH M. MURCHISON, AND RAYMOND HOOD, GODLEY & FOUILHOUX, ASSOCIATED, ARCHITECTS



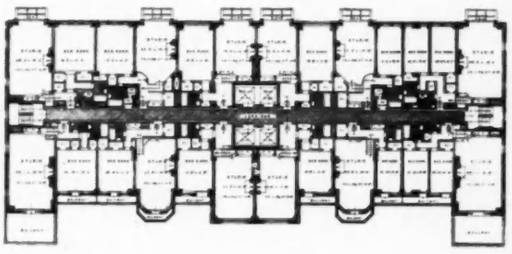
2ND TO 12TH FLOORS



PENT HOUSE FLOOR



GROUND FLOOR



16TH FLOOR

COST AND CONSTRUCTION DATA

Date of Completion: January, 1930.

Total Number of Apartments: 816.

Total Number of Apartments per Floor: 22 in each of the buildings.

Total Number of Rooms per Apartment: Ones, twos and threes.

Structural Frame: Steel.

Structural Floor System: Concrete.

Heating: Steam.

Ventilating: Only in kitchens.

Elevators: Electric.

Lighting: Electric.

Radiators: Covered.

Windows: Metal casements.

Trim: Metal.

Cubic Foot Cost: About 76 cents.

THE demands of sophisticated tenants who wish to live close to the center of New York social and business activity are satisfied in this most modern of New York apartments. The plan provides for the most efficient type of modern living, as the large rooms are used as living rooms and bedrooms and, on occasion, as dining rooms. The building reflects in its entire design (i. e., both plan, exterior and interior treatments) the spirit of the modern American. The dominance of horizontal lines is the result of the use of broad casement windows and bands of dark brick between. There is a freshness in the use of materials and the freedom of decorative motif that shows a new conception of design possibilities. Excellence of plan is here equaled by imaginative and pleasing decorative treatment.

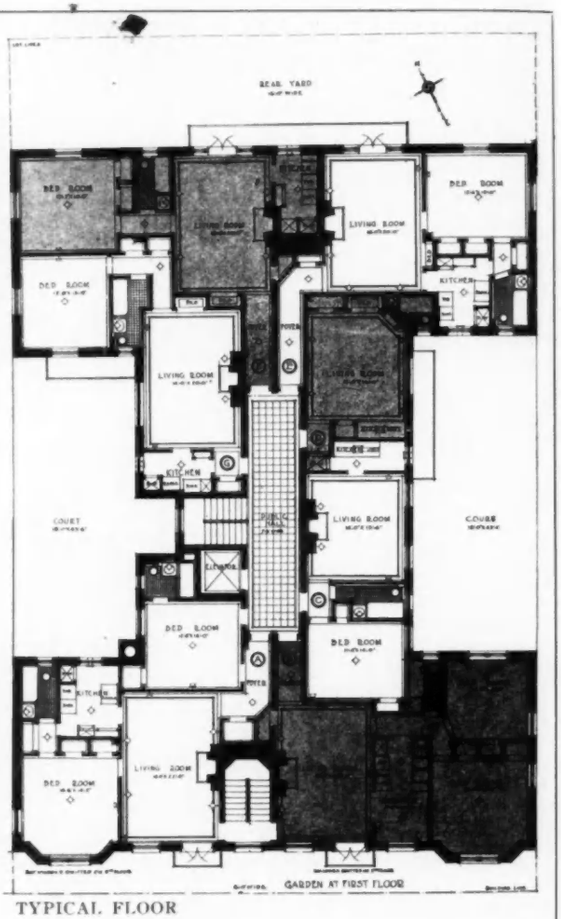
BEAUX ARTS APARTMENTS, NEW YORK.
THE FIRM OF KENNETH M. MURCHISON, AND RAYMOND HOOD, GODLEY & FOUILHOUX, ASSOCIATED, ARCHITECTS

Gillies

345 EAST 68TH STREET, NEW YORK.
EMILIO LEVY, ARCHITECT

ARCHED ENTRANCE

FIRST FLOOR



TYPICAL FLOOR

THE design of the facade of this building is a peculiar mixture of motifs from various styles with perhaps a dominance of English Georgian. It is hard to understand why an adapted Lombardy Romanesque brick cornice should be used in this connection. The iron balconies do not seem to enhance the beauty of the facade, as they suggest fire escapes. It is unfortunate that it was found necessary to place three of the living rooms on courts and to use such long, narrow corridors. The fact that most of the living rooms have real fireplaces undoubtedly adds to their attractiveness.

345 EAST 68TH STREET, NEW YORK.
EMILIO LEVY, ARCHITECT

THE MODERATE-PRICED APARTMENT HOTEL

BY

H. DOUGLAS IVES

OF FRED F. FRENCH COMPANY

THE increasing difficulties of transportation, the overcrowded subways, and the traffic jams that occur on the streets during the rush hours, are rapidly causing workers of moderate means who are employed either in the Grand Central Zone or in Wall Street, to wonder whether it is economy to live farther and farther from their places of employment for the sake of living in one of the traditional type of apartments, or whether they might not be much better off living in one of the newer type of "efficiency" apartments, of two or possibly of only one room, whose aim is to relieve the burden of the housewife or business woman, most of whose daylight hours must be spent in acquiring the means necessary to live.

In New York the apartment hotel has been developed to meet this specific need from both the owner's and the tenant's viewpoint. The high and increasing cost of land and construction precludes the possibility of producing a profitable investment in or near the center of the city if the usual type of five or six rooms must be rented at a rate within the means of the vast majority, so that complete and attractive living facilities must be provided within a smaller floor area. Generally speaking, apartment hotels may be divided into two groups,—those on Fifth and upper Park Avenues, which cater to a wealthy and exclusive class, owners, perhaps, of large estates in the country who require a *pied-a-terre* in town and wish to be surrounded by their own furnishings and belongings during their comparatively short stay, and with consequently greater comfort and feeling of security than would be the case in a purely transient hotel, and to whom a low rental is not a vital consideration; and those buildings such as Prospect, Windsor and Woodstock Towers in Tudor City, whose tenants are those of more moderate means, but to whom ease of living and accessibility are of prime importance. These buildings consist largely of "one-room apartments," for which there appears to be a large and growing demand, and which may be occupied more or less

Tudor City Development, New York. Fred F. French Co., Architects

Woodstock Tower, New York. Fred F. French Co., Architects

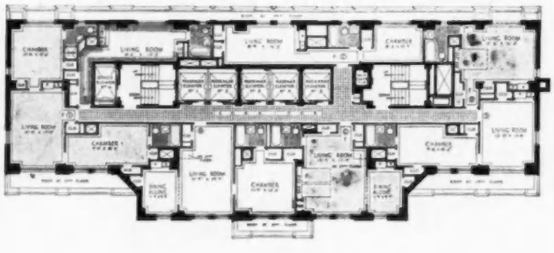
transiently by the busy executive or others who maintain residences in the country but who find it necessary to spend one or two evenings in town each week, and by the very large number of young men and women starting their great adventure in the great city, but who heretofore have found living quarters in that rapidly disappearing symbol of "The Age of Innocence,"—the brownstone-fronted boarding house.

In planning a building of this type, the project as a whole must be studied somewhat more carefully than the ordinary apartment house, as features must be provided that belong to both the apartment house and the purely transient type of hotel. The requirements of each individual building vary somewhat due to location and probable type of tenant, and where space is so strictly limited the greatest ingenuity is often required to provide the maximum amount of comfort and convenience for the lowest possible rental returns at which the building can be made a profitable investment for the owner.

The typical floor plan should be arranged as simply as possible, and interior courts must be avoided, as they are noisy and the rooms on the lower floors are inevitably dark and consequently difficult to rent. If a suitable piece of property can be obtained, a plan such as that of Woodstock Tower in Tudor City, with the utilities such as stairs and elevators grouped at the center and the rooms facing on the street and rear yard, provides a most economical arrangement from the point of view of service and maintenance and allows for the maximum amount of light and ventilation for each apartment. The "setbacks" on the upper floors which are required under the Zoning and Multiple Dwelling Laws can be utilized as terraces and are a renting feature which appeals to many. There should, however, be an iron railing between each of the two separate apartment terraces, giving each tenant a greater feeling of security. Access to it should be by a

Woodstock Tower, New York. Typical Floor Plans

2nd to 14th Floors



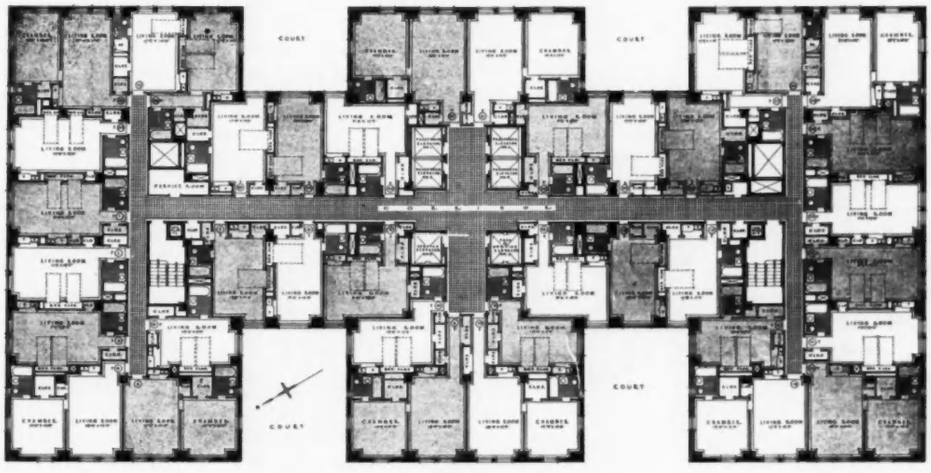
29th and 30th Floors

door instead of,—or in addition to,—the regular window. Steel casement doors and windows have been used throughout Tudor City and have been found eminently satisfactory for buildings of this type.

The general arrangement of "one-room" apartments has become more or less standardized, in that door beds, kitchenettes and interior bathrooms are common to all. The space for the first of these should be so located that little moving of furniture will be necessary when the beds are in use, and it must be large enough to provide adequate ventilation when they are not. Twin beds are always preferable to one large bed, as these rooms are frequently rented by two persons; for the same reason two closets are desirable,—more if space is available. According to the new Multiple Dwelling Law a kitchenette when it is of the recess or closet type, that customarily is found in "one-roomers," must not be over 10 feet in length, but it has been found that half this is sufficient to contain all the equipment necessary; a small sink with a drain board over which there should be a dresser large enough to contain dishes for a simple meal for five or six persons; mechanical or electrical refrigeration is of course essential, and there are machines now on the market which have been designed to meet these conditions and still provide enough space to meet the requirements of the average tenant whose cooking is usually limited to preparing a light breakfast of coffee and eggs. On top of the refrigerator may be set a small electric or gas stove of the open-burner type. Space under the sink should be provided for the temporary disposal of garbage before it can be removed to the incinerator, and this can best be done by the use of oiled or waxed paper bags which fit into containers, various types and sizes of which are easily obtainable.

Windsor Tower, New York. Fred F. French Co., Architects

Exterior bathrooms are of course a little more desirable, but it is not always possible to provide them without utilizing space which might better be used for increasing the sizes of the rooms. The interior type has become common practice, and is thoroughly satisfactory, as the Building Department requires proper ventilation. Tile floors and



Typical Floor Plan. Windsor Tower, New York

wainscots are a standard treatment, and the walls and ceilings above the latter can be effectively decorated by the use of waterproof wall paper, which is not only economical to maintain but helps to relieve the institutional feeling found in so many buildings of this kind. The fixtures should be of the regulation sizes, and a 5-foot tub with a shower above will be found satisfactory.

It seems needless to say that every effort within reason should be made to soundproof the partitions between apartments, and much can be done by the use of heavy quilting or felt, but as far as the writer is aware, this problem has not as yet been satisfactorily and yet economically solved. The desirability of using floor and table lamps is becoming increasingly evident,—they are more flexible and tend to give a more homelike appearance to the room than wall brackets, which are difficult to locate in positions that will give satisfactory results and not be damaged by the hurried opening of doors or interfere with the wall decorations; consequently a close-up ceiling fixture for general lighting and three or more base outlets constitute a better arrangement. If there is a foyer, this should also have a ceiling light,—in fact the only wall brackets necessary are one in the kitchenette and one over or on either side of the medicine cabinet in the bathroom.

A width of 5 feet will usually be found ample for the public corridors on the typical floor. Carpets are advisable if only for the purely practical reason that they help to deaden sound,—an important consideration, as the entrance doors to apartments are required to have some form of ventilating louver to the detriment of their soundproofing quality.

An incinerator is a necessity and should be located as centrally as possible. The collection of garbage is a matter to be decided upon by the management of the building, but in many cases the tenant prefers to dispose of it himself rather than wait for a regular collection at an hour which may not be convenient. The incinerator must not open directly into a public hall, but into a well ventilated space equipped with shelves to receive empty bottles or boxes which are too large or too dangerous to be disposed of other than by being collected and taken down in the service elevator.

The elevator requirements must be figured in much the same manner as for an office building, in that a peak load is reached both in the morning and in the evening, and a further burden is also placed upon the system during these "rush hours" by the demand for room service. One or more purely service cars, depending upon the size of the building, must be provided in addition to one which can be used for both passengers and service. There should also be a freight elevator at the service entrance running from the street level to the basement or sub-basement to facilitate the handling of heavy baggage and supplies, and for removal of ashes and rubbish.

The public space requirements of an apartment hotel approximate very closely those of the transient hotel in that offices, restaurants, and lounge rooms are common to both, although of course in the former on a somewhat smaller scale; and the architect, when called upon to design such a building, must be prepared to find space on the first floor for news and cigar stands, telegraph office, and possibly a theater or tourist agency,—features which add greatly to the comfort and convenience of the tenants.

The location, equipment and arrangement of the restaurant and kitchen should be given the most careful thought, as the management will be called upon to provide a wide choice of club breakfasts and table d'hote luncheons and dinners, as well as a la carte, in addition to the room service. In Tudor City, which has at present five apartment hotels containing over 2,000 apartments, it has been found necessary to vary the type of restaurants to meet the extensive range in the tastes and desires of so many tenants.

In the basement or sub-basement, in addition to the space requirements of mechanical equipment, store rooms for the kitchen, meter rooms, etc., ample accommodation must be provided for trunks which must also be easily accessible to the tenants, as naturally the size of the apartments does not allow for any of these, nor many bags, being kept in them. Space must also be found for the valet service, locker rooms and toilets for both male and female attendants, and a parcel room. This latter should be located as near as possible to the service entrance, so as to make for better control. To sum up, the requirements for this floor are almost identical to those for the transient type of hotel.

The architectural treatment of the exterior or the decorative feature of the public spaces of the interior is a matter for the personal taste of the architect and owner, and many an architect will, at times, suffer acutely in trying to develop an interesting composition for the facade, and will find that beauty must in a sense give precedence to the economical arrangement and lighting of the rooms, and to the exigencies of the budget.

As the apartment hotel is essentially a residential building occupied by permanent tenants, some effort should be made to introduce a domestic note into the furnishings and decorations of the lounge and reception rooms, in contrast to the impersonal and formal arrangement which must of necessity be the case in the purely transient hotel, and where this has been done it has been appreciated by the tenants, who are tempted to linger.

COÖPERATIVE APARTMENTS

BY

ELECTUS D. LITCHFIELD

FOR the average New Yorker, and in particular for one who lives in the Borough of Manhattan, a coöperative apartment provides the most practical embodiment of the city home. There are still those who prefer the luxury and prestige, even coupled with the attendant troubles, of the private house; but taxes and servant troubles have become so much of a burden that, in Manhattan at least, the private house bids fair to soon become extinct. Everyone knows that the wages of domestic servants have increased tremendously since the war, and the great difficulty there is in obtaining well trained and adequate servants. Gone are those paragons who served in our mothers' houses. The invention of labor-saving devices for cleaning, cooking and for the laundry have seemed to reduce, rather than to increase, what the average maid considers a full day's work. Less space and less waste space in the home seem a necessity.

One after another of the notable New York mansions has disappeared, and in its stead has risen a great apartment house in which quite often the owner of the original house has purchased an apartment. The papers have headlines when, as still, but very occasionally, happens, plans are filed for a private house in Manhattan. Hundreds, if not thousands of apartments are rented and sold to one individual residence.

ADVANTAGES OF THE COOPERATIVE APARTMENT

The coöperative is the aristocrat among apartments,—not that it costs more, for in the long run it undoubtedly costs less than the nearest approach to equal value in a rented apartment. Its popularity is due to the fact that it usually does, and always should, approach the old private residence in prestige, convenience and in individual and homelike quality. The disadvantages of a coöperative apartment are few. The present financial depression has so far provided the answer to a fear which many had,—that when times were bad, many of these coöperative apartments would be offered for resale with few takers. But so far neither the number of the apartments so offered, nor the difficulty of finding a market has been found greater than was found with a private house in previous periods of financial stringency. Among the various advantages of a coöperatively owned apartment are permanence of location among satisfactory neighbors and a more or less definitely fixed and moderate annual expense. The reason for the latter is obvious, for several of the various profits which go into the construction and operation of a rented apartment are avoided in a coöperative undertaking, so that, except in the most costly locations, it is possible to keep the annual maintenance, plus the interest on the investment, below the rental which would be normally asked for a similar rented apartment. There are, it is true, coöperative apartments in Manhattan where the first cost of the land and elaboration of the building have resulted in excessive annual cost of ownership as compared to the nearest approach in a rented apartment; but, on the other hand, it must be said that there probably are no rented apartments having an equally satisfactory location and being equally satisfactory in plan and arrangement. In other words, these apartments are unique in location and design and, like all unusual things, demand a special price.

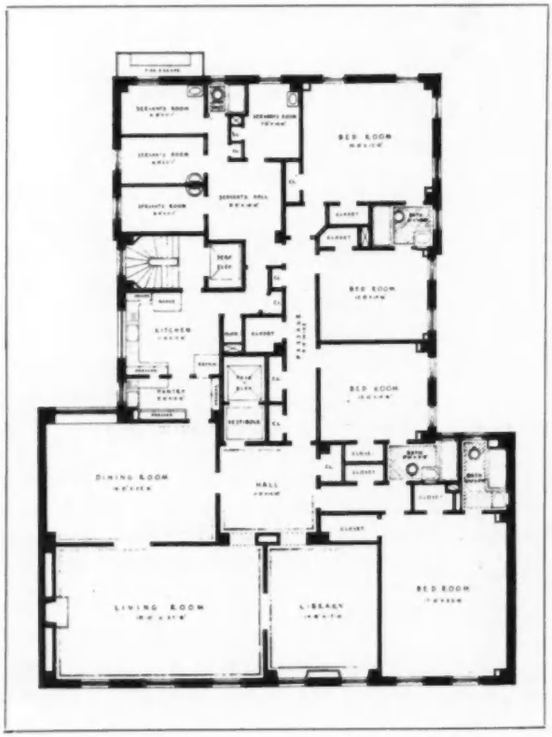
No. 50 East 79th Street, New York.
Electus D. Litchfield, Architect

RESIDENTIAL CHARACTER

Whether located on the most expensive corner

No. 79 East 79th Street, New York.
Electus D. Litchfield, Architect

Typical Floor Plan Below



or in a less desirable part of town, the coöperative apartment should have much more for the owner than any rented apartment which he is likely to obtain. In the first place, the plans for co-operative apartments are made, as a rule, by architects specially trained and familiar with the social and living requirements of the purchasers; and particular care has been given to the disposition, size and details of the rooms, so as to make them conform as nearly as possible to the wants of persons of means and education. In addition to this, minor changes, and often very extensive changes, have been made to meet the personal taste of the purchasers, and the decoration has been done, either by, or under the direction of, the purchasing owner himself. These apartments are, therefore, much more personal and individual than the rented apartment. Many of them have the very desirable feature of the duplex plan, and sometimes occupy even three stories, and reflect, in a very considerable degree, the atmosphere of a well planned private house. The planning of a coöperative apartment building is, in consequence, a much more difficult problem than that of the rented apartment, and this is particularly so if, as it seems to me should always be the case, a real effort is made to give to its exterior a logical, pleasing and definitely residential character.

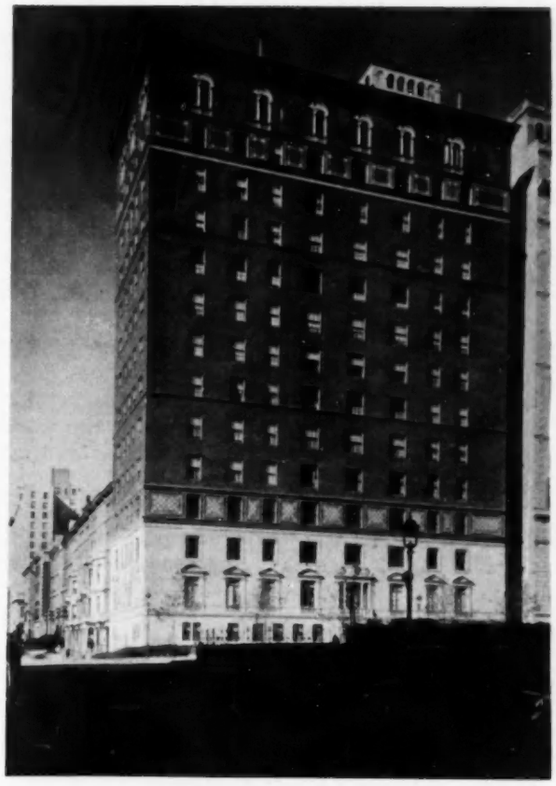
EXTERIOR DESIGN

It has always seemed to me that the horizontal belt courses, so characteristic of the Italian palace, the ancient prototype of the modern apartment house, go far toward giving a residential character to these buildings. The perfectly natural trend toward verticality in towering office buildings seems to emphasize that in the residential type of structure the horizontal should be the important element of the design. The entirely original shape, however, which the new Multiple Dwelling Law in New York imposes upon the apartment building, seems to demand a complete breaking away from precedent and tradition in its design. The height, lot coverage, and setbacks are all specified under this law, and economic considerations usually demand that the building have all of the volume possible which the law permits. The law having been written with very little regard to æsthetics, the maximum possible envelope of the structure does not usually produce a symmetrical mass. Coupled with the difficulties which are a result of the law, there are the difficulties which are inherent in the normal layout of the American home; there are the large living room, with preferably not more than two windows on a side; the dining room, which should also have two windows, somewhat smaller; the library, with one or two windows;

the bedrooms with two windows where possible, and with space between for bed or bureau; numerous bathrooms; a kitchen, which should have at least one large window; and the small servants' rooms with one window each. It is apparent that the windows in the living room must be larger than those in the maids' rooms and must be much farther apart center to center. Where there is but one apartment to each entire floor in the building, the difficulties of producing a symmetrical exterior design are apparent.

AN IDEAL BUILDING OPERATION

The coöperative apartment in New York, when the market conditions are satisfactory, is the ideal building operation from the operator's standpoint. When, as so often has been the case, the apartments are all sold by, or before, the completion of the construction of the building, the operator, or operating syndicate, has all of its investment out of the undertaking and its profit in hand within a year or 18 months from the inception of the operation. It is greatly to be desired, therefore, that the individual apartments and the entire building shall be so attractive in location, planning and in financial set-up that it shall be completely sold at as early a date as possible. If the sale of many of the apartments is long deferred, the maintenance, which starts with the completion of the building, soon eats into the profits of the undertaking. The maintenance is usually somewhere around 10 per cent of the cash price of the apartments, and the total sales price is likely to approximate 50 per cent of the entire cost, including the estimated profit of the transaction. The other 50 per cent would be in a mortgage. If the sale of all of the apartments should be deferred one year, the operator would have no return from his invested funds and, in addition, would have to supply more than 10 per cent of his original investment in cash, in order to maintain the building. If the estimated profit of the transaction had been 15 per cent on the total cost of land and building, and the cash sales prices of the apartments were set at



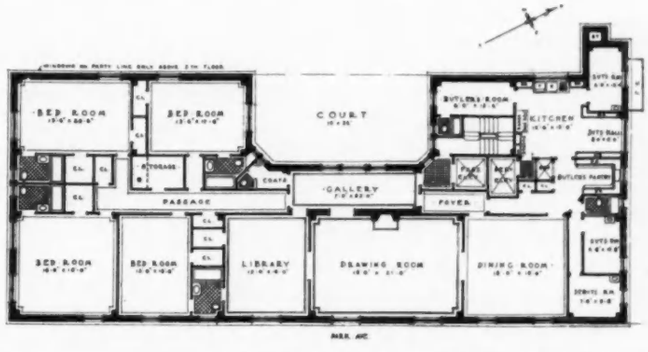
800 Park Avenue, New York

50 per cent, it is obvious that 5 per cent must be expended per annum for maintenance and the total 15 per cent profit would disappear in three years. It is, therefore, of the greatest importance to the operator that everything within reason be done to make the plan of the prospective building so attractive as to expedite the sales in every way. From the architect's standpoint it is a thrilling game, particularly if, as is often the case, he decides to have a financial interest in the undertaking.

ONE APARTMENT TO A FLOOR

Many things besides skill in planning go into

800 Park Avenue, New York. Electus D. Litchfield, Architect



Typical Floor Plan

making the success of the undertaking. From the purchaser's standpoint the building having but one apartment to a floor, or, in any case, with but one apartment entrance on a floor to a single bank of elevators, is most desirable; but from the standpoint of cost, the larger the building the cheaper per room it can be built, and the more apartments to a single bank of elevators the more economical the operation. On the other hand, a building with but one apartment to a floor requires but few sales for the completion of the undertaking, and in that respect it has for the operator more value than the multi-apartment building.

NO. 800 PARK AVENUE, NEW YORK

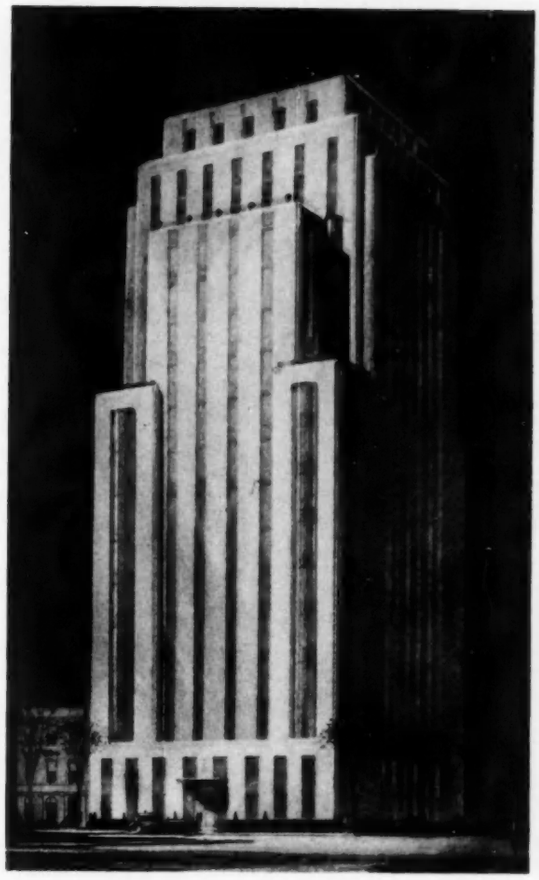
No. 800 Park Avenue occupies a plot 44 feet by 120 feet, irregular, at the northwest corner of Park Avenue and 74th Street. A few feet more of length on Park Avenue would have made possible a somewhat more generous layout for the service portion of the apartments, which would have been more desirable; but aside from this, the size and disposition of the plot were almost ideal for the planning of an adequate apartment for the usual sized family of social position. The plot lent itself to the provision of a desirable number of rooms of comfortable sizes, all well lighted. One of its particular virtues is the lighting of the foyer hall from the court on the west side of the plot, which borrows light from the yards of adjoining buildings. There was space enough to provide a bath for each room and also the very necessary guest toilet and coat closet off the foyer hall. In the service portion of the building it was possible to have the butler's room, with its own bath, entirely apart from the maids' suite. In the design of the exterior we were influenced by the precedent of the fifteenth century Italian palace. The architectural interest is concentrated on the three lower stories, which were made of limestone, surmounted by a tall shaft of an almost lavender colored Holland brick, with an interesting texture given by cross bond, unornamented except by the simply moulded band courses; the shaft being crowned by two decorative stories in brick, stone and terra cotta. It was desirable, of course, that the elevation should be as symmetrical as possible in effect and, with the asymmetrical plan, a very interesting adjustment had to be made of window sizes and piers to adequately meet the plan requirements and yet obtain a quiet and reserved facade. The problem might, perhaps, have been solved by having a greater number of small windows; but we felt that the larger wall surfaces and the larger windows were more satisfactory for the exterior and for the interior as well. In order that the wall surface of the shaft should be broken up as little as possible, stone lintels were omitted and sills, also, except for a 1-inch slab of slate which was practically invisible. As the actual work proceeded I felt a demand for an easy transition from the limestone of the lower stories to the simple shaft of brick, and I finally hit upon the idea of the checker board panels made of brick and softly contrasting cement, which seemed to adequately accomplish the purpose.

NO. 79 EAST 79TH STREET

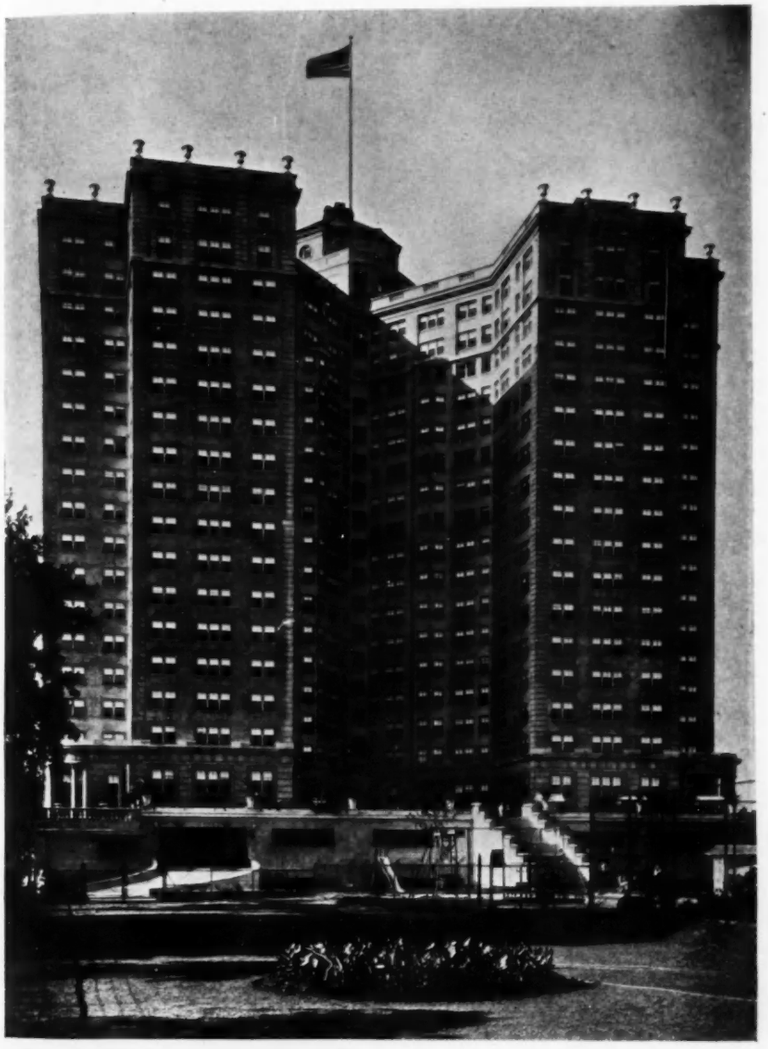
No. 79 East 79th Street, like 800 Park Avenue, has but one apartment to a floor. Unlike 800 Park Avenue, it was not built on a corner but on an inside rectangular plot 63 feet in width and 102 feet in depth. The apartments in this building were planned to meet the wants of very much the same sort of families as those to which 800 Park Avenue was sold,—families of reasonable size with several, but no great retinue, of servants, and not over-extravagant in their tastes. These families require three or four master's bedrooms, each with its own bath; a living room as large as possible; a good sized dining room, not less than 16 by 22; if possible, a library; and the usual pantry, kitchen, maids' rooms and service hall. As at 800 Park Avenue, the disposition of living room, library and bedrooms in plan, demanded an asymmetrical arrangement of windows on the exterior, if the interior was to be properly served. Here again, therefore, it was necessary to very carefully study the widths and centering of windows and piers to produce an agreeable facade. For one reason or another both of these buildings seemed to meet the popular demand and were completely sold at about the time of their completion; and in both of them resales have been made at a considerable advance upon the original prices.

NO. 50 EAST 79TH STREET

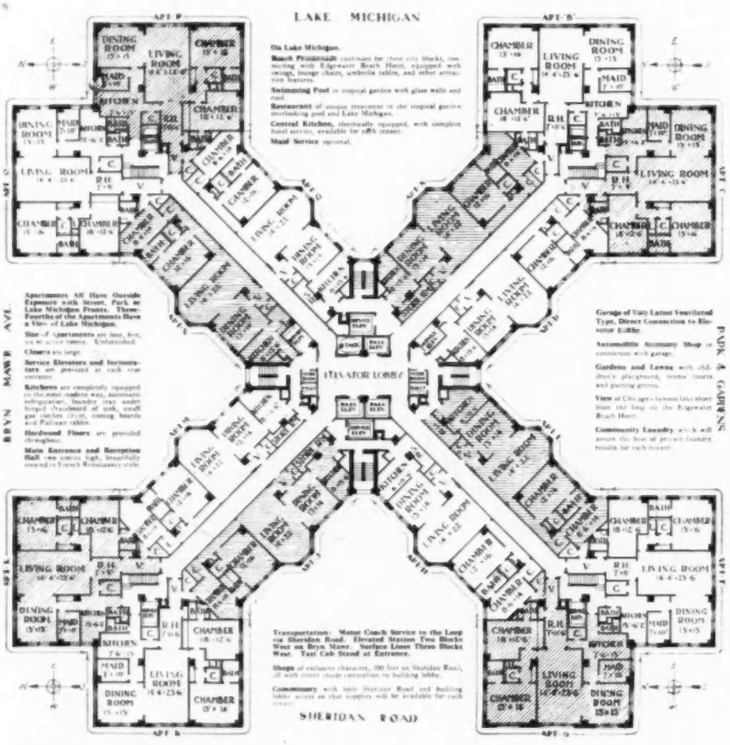
No. 50 East 79th Street is planned for two apartments on a floor, and the whole building is to be carried with setbacks to the greater height permitted under the Multiple Dwelling Law, to the requirements of which it is of course subject. The site is approximately 100 by 100, and most floors are planned with two apartments of ten or eleven rooms each. As I have said, the building designed under the Multiple Dwelling Law has a mass which is quite its own. It cannot be built to the great heights possible for the office building, and the setbacks, which are required under the Law, if it is to be carried to its new maximum height, give it a mass entirely different from that of any class of buildings heretofore built. It is interesting that this is the case, and it will no doubt result in the creation of a type of multiple residence building here in New York which will become characteristic of the city and unique in appearance.



PRELIMINARY STUDIES FOR TWO MODERN APARTMENT HOUSES ON ASTOR STREET, CHICAGO. PHILIP B. MAHER, ARCHITECT



EDGEWATER BEACH APARTMENTS, CHICAGO. BENJAMIN H. MARSHALL, ARCHITECT



TYPICAL FLOOR PLAN

EDGEWATER BEACH APARTMENTS, CHICAGO.
BENJAMIN H. MARSHALL, ARCHITECT

1100 NORTH DEARBORN STREET, CHICAGO. McNALLY AND QUINN, ARCHITECTS

Fuermann

2000 LINCOLN PARK WEST, CHICAGO. McNALLY AND QUINN, ARCHITECTS

TYPICAL FLOOR

1100 NORTH DEARBORN STREET, CHICAGO.
McNALLY & QUINN, ARCHITECTS

CONSTRUCTION DATA

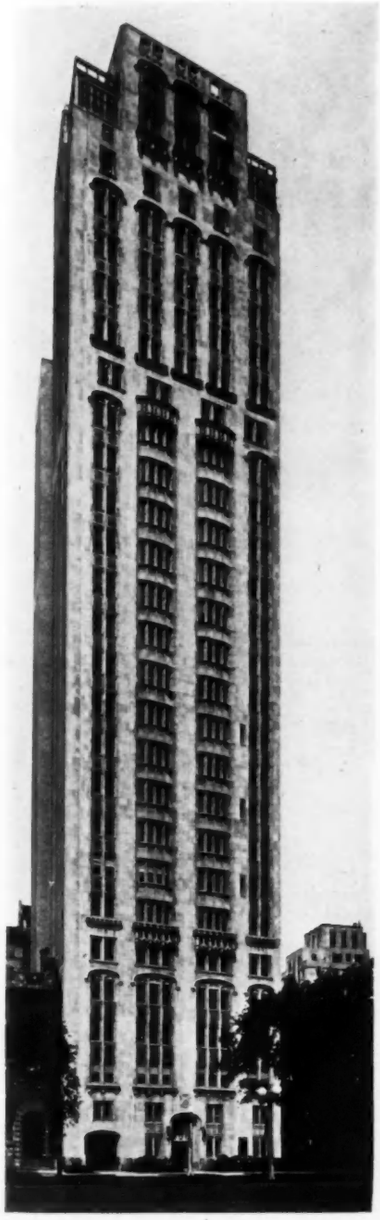
Date of Completion: April, 1930.
Total Number of Apartments: 211.
Total Number of Apartments per Floor: 14.
Total Number of Rooms per Apartment: 2, 3, 4, 5.
Structural Frame: Reinforced concrete.
Structural Floor System: Concrete joists, pan forms.
Heating: Vapor vacuum steam, coal burning.
Ventilating: Mechanical ventilation in kitchens, corridors, stair halls.
Elevators: Two passenger, car switch control; one service, combination car, switch and collective push button control.
Lighting: All wiring in conduit.
Radiators: Cabinet type.
Plumbing: Water pipe, galvanized wrought iron; soil pipe, cast iron.
Windows: Double hung wood.
Trim: Birch.
Cubical Contents: 3,061,014 ft.

TYPICAL FLOOR

2000 LINCOLN PARK WEST, CHICAGO.
McNALLY & QUINN, ARCHITECTS

CONSTRUCTION DATA

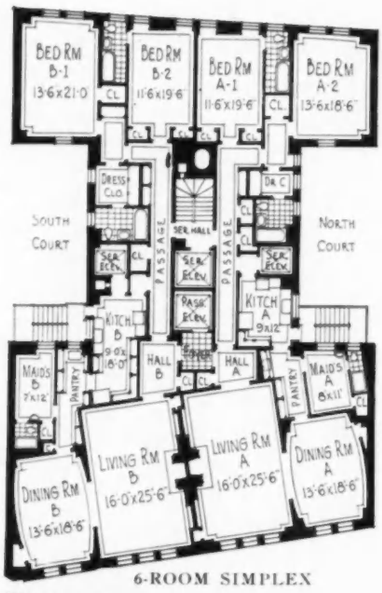
Date of Completion: April, 1930.
Total Number of Apartments: 247.
Total Number of Apartments per Floor: 13.
Total Number of Rooms per Apartment: 2, 3, 4.
Structural Frame: Reinforced concrete.
Structural Floor System: Concrete joists, pan forms.
Heating: Vapor—vacuum steam, coal burning.
Ventilating: Mechanical ventilation in kitchens and stair halls.
Elevators: Two passenger, car switch control; one service, collective push button control.
Lighting: All wiring in conduit.
Radiators: Cast iron.
Plumbing: Water pipe, galvanized wrought iron; soil pipe, cast iron.
Windows: Double hung wood.
Trim: Birch.
Cubical Contents: 2,043,160 ft.



1242 LAKE SHORE DRIVE, CHICAGO. ROBERT S. DE GOLYER & CO., ARCHITECTS

1648 EAST 50TH STREET, CHICAGO. ROBERT S. DE GOLYER & CO., ARCHITECTS. CHARLES MORGAN, ASSOCIATE

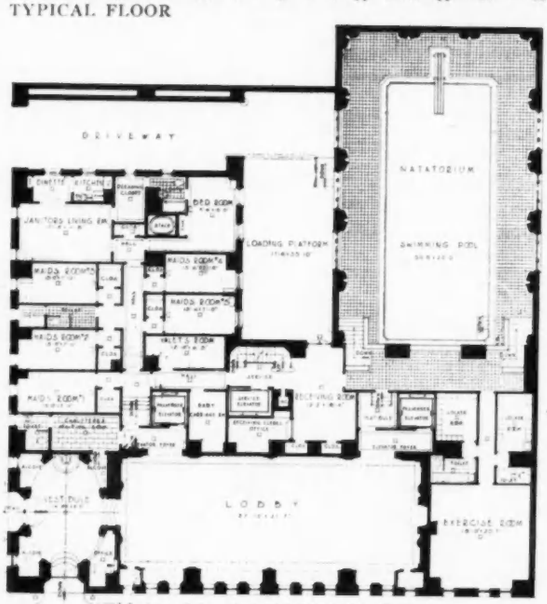
Bowman



6-ROOM SIMPLEX

TYPICAL FLOOR

11-ROOM SIMPLEX



FIRST FLOOR

CONSTRUCTION DATA

Date of Completion: 1930.
Total Number of Apartments: 35.
Total Number of Apartments per Floor: 1, 1½, 2.
Total Number of Rooms per Apartment: 6, 8 (simplex and duplex), 10, 11 and special layouts up to 16.
Structural Frame: Steel.
Structural Floor System: Concrete joist.
Heating: Vapor.
Ventilating: Kitchens and elevator foyers.
Radiators: Concealed.
Windows: Wood, double-hung.
Trim: Birch.
Cubical Contents: 1,445,000 ft.

CONSTRUCTION DATA

Date of Completion: 1929.
Total Number of Apartments: 20.
Total Number of Apartments per Floor: 2.
Total Number of Rooms per Apartment: 7 and 9.
Structural Frame: Concrete.
Structural Floor System: Concrete joist.
Heating: Vapor.
Ventilating: Laundries and kitchens.
Windows: Steel, lower floors; wood above.
Trim: Birch.
Cubical Contents: 1,940,000 ft.

1242 LAKE SHORE DRIVE, CHICAGO. 1648 EAST 50TH STREET, CHICAGO.
ROBERT S. DE GOLYER & CO., ARCHITECTS

4940 EAST END AVENUE, CHICAGO. B. LEO STEIF & CO., ARCHITECTS

3800 SHERIDAN ROAD CHICAGO. B. LEO STEIF & CO., ARCHITECTS

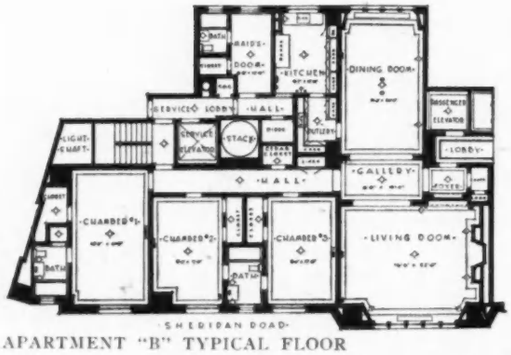
Fuermann

TYPICAL FLOOR

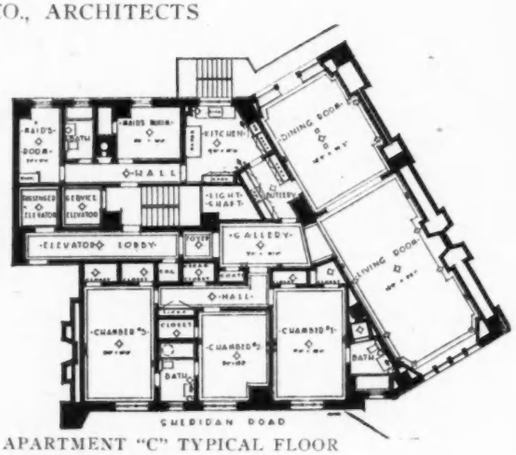
COST AND CONSTRUCTION DATA

Date of Completion: May, 1929.
Total Number of Apartments: 99.
Total Number of Apartments per Floor: 5.
Total Number of Rooms per Apartment: 3, 4, 5 and 6.
Structural Frame: Reinforced concrete on wood pile foundations.
Structural Floor System: Reinforced concrete joists.
Heating: Vacuum.
Ventilating: Exhaust system in kitchens.
Elevators: Gearless.
Lighting: In galvanized conduit.
Radiators: Slim type.
Plumbing: Enameled tubs, china lavatories and water closets; black tarred wastes and galvanized water piping.
Windows: Wood double hung with steel casements in kitchens.
Trim: Birch and unit metal bucks.
Cubical Contents: 1,612,000 ft.
Cubic Foot Cost: 63 cents.
Total Cost: $1,015,560.

4940 EAST END AVENUE, CHICAGO.
B. LEO STEIF & CO., ARCHITECTS



APARTMENT "B" TYPICAL FLOOR



APARTMENT "C" TYPICAL FLOOR

COST AND CONSTRUCTION DATA

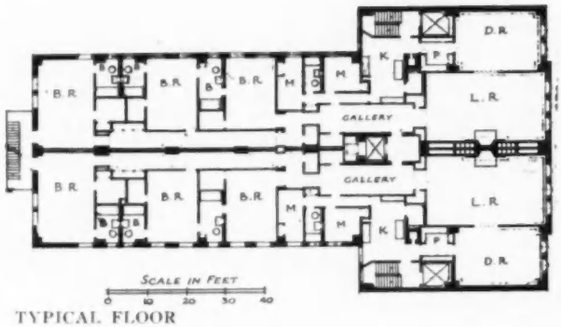
Date of Completion: October, 1927.
Total Number of Apartments: 101.
Total Number of Apartments per Floor: 5.
Total Number of Rooms per Apartment: 5, 6, 7, 8, 9 and 11.
Structural Floor System: Reinforced concrete joists.
Heating: Vacuum.
Ventilating: Exhaust system in kitchens.
Elevators: Gearless micro-drive.
Lighting: In galvanized conduit.
Radiators: Cast iron concealed.
Plumbing: Enameled tubs, china lavatories and water closets; black tarred wastes and galvanized water piping.
Windows: Steel casements.
Trim: Birch.
Cubical Contents: 2,750,000 ft.
Cubic Foot Cost: 66 cents.
Total Cost: $1,815,000.

4940 EAST END AVENUE, CHICAGO.
B. LEO STEIF & CO., ARCHITECTS

1540 LAKE SHORE DRIVE, CHICAGO. HUSZAGH & HILL, ARCHITECTS. J. W. McCARTHY, CONSULTING ARCHITECT

Trowbridge

210 EAST PEARSON STREET, CHICAGO. HUSZAGH & HILL, ARCHITECTS

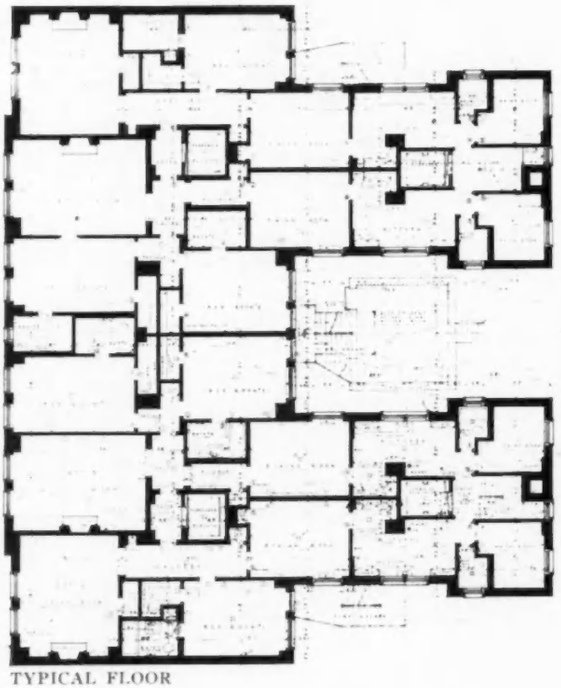


TYPICAL FLOOR

1540 LAKE SHORE DRIVE, CHICAGO. HUSZAGH & HILL, ARCHITECTS; J. W. McCARTHY, CONSULTING ARCHITECT

COST AND CONSTRUCTION DATA

Date of Completion: July, 1926.
Total Number of Apartments: 30, 8-room.
Total Number of Apartments per Floor: 2.
Total Number of Rooms per Apartment: 8.
Structural Frame: Reinforced concrete.
Structural Floor System: Concrete joists.
Heating: Steam.
Elevators: Electric.
Lighting: Electric.
Radiators: Cast iron, concealed.
Windows: Metal casement.
Trim: Wood.
Cubical Contents: 1,511,000 ft.
Cubic Foot Cost: 61 cents.
Total Cost: $1,521,265.



TYPICAL FLOOR

210 EAST PEARSON STREET, CHICAGO. HUSZAGH & HILL, ARCHITECTS

COST AND CONSTRUCTION DATA

Date of Completion: October, 1927.
Total Number of Apartments: 62.
Total Number of Apartments per Floor: 4.
Total Number of Rooms per Apartment: 30, 5-room; 30, 6-room; 2, 2-room.
Structural Frame: Concrete.
Structural Floor System: Concrete joists.
Heating: Steam.
Ventilating: Bathrooms only.
Elevators: Electric.
Lighting: Electric.
Radiators: Cast iron, concealed.
Windows: Wood, double-hung.
Trim: Wood.
Cubical Contents: 1,230,000 ft.
Cubic Foot Cost: 63 cents.
Total Cost: $1,216,926.

Trowbridge

201 EAST DELAWARE PLACE, CHICAGO.
THIELBAR & FUGARD, ARCHITECTS

TYPICAL FLOOR

COST AND CONSTRUCTION DATA

Date of Completion: 1926.

Total Number of Apartments: 115, including seven-room bungalow on roof.

Total Number of Apartments per Floor: 8.

Total Number of Rooms per Apartment: 2, 3, 4.

Structural Frame: Reinforced concrete.

Structural Floor System: Reinforced concrete.

Heating: Vacuum steam.

Ventilating: Bathroom exhaust only.

Elevator: Variable speed.

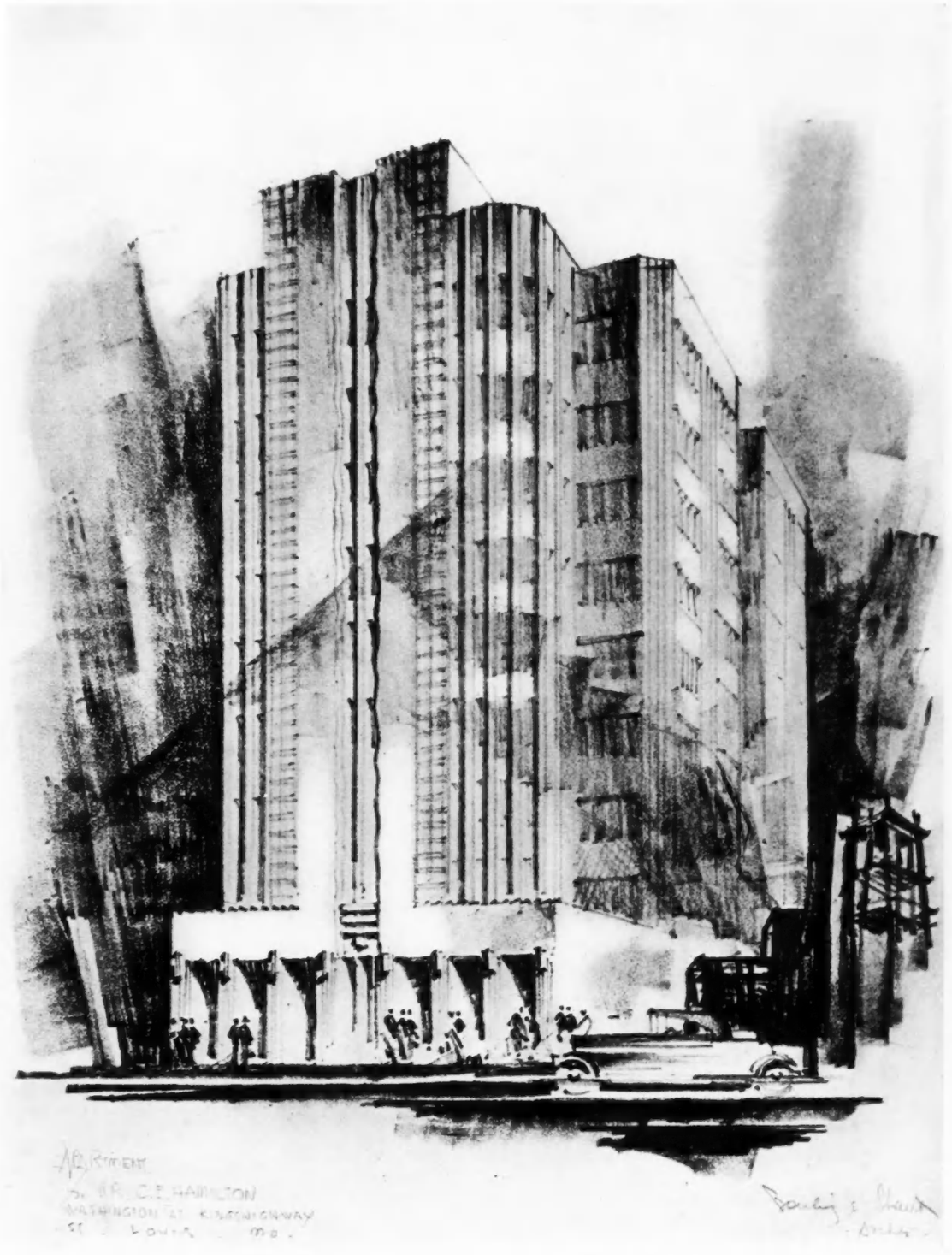
Radiators: Standard floor type.

Windows: Wood, double-hung.

Trim: Birch.

Cubic Foot Cost: 62.8 cents.

201 EAST DELAWARE PLACE, CHICAGO.
THIELBAR & FUGARD, ARCHITECTS



APARTMENT FOR C. E. HAMILTON, ST. LOUIS.
BOWLING & SHANK, ARCHITECTS

172 BEACON STREET, BOSTON.
BIGELOW & WADSWORTH, ARCHITECTS

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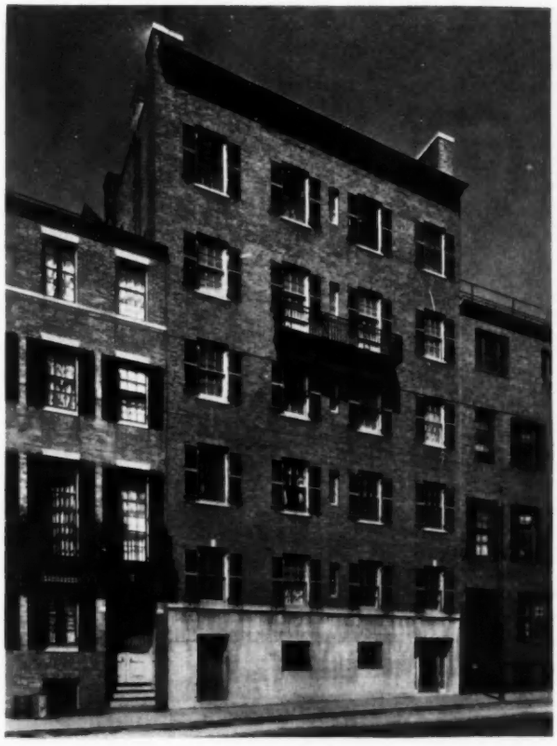
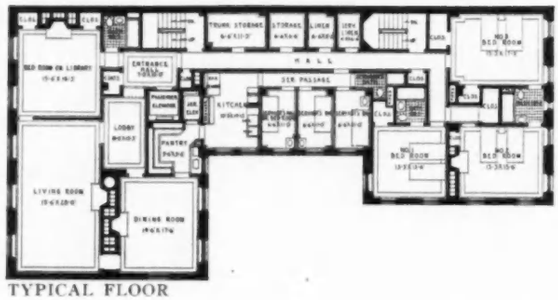


116 CHARLES STREET, BOSTON.
BIGELOW & WADSWORTH, ARCHITECTS

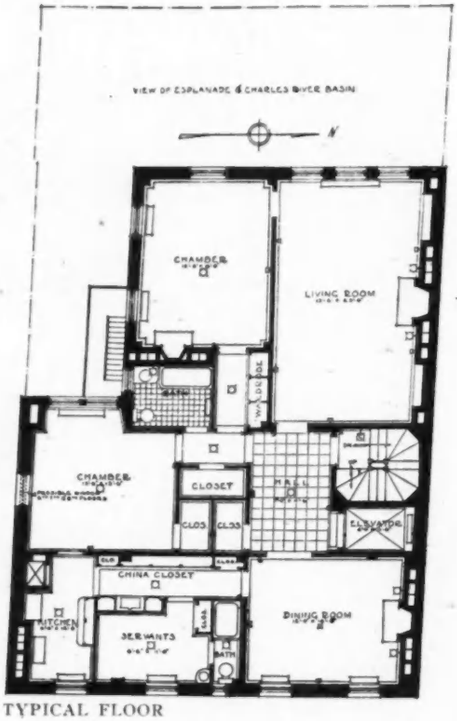


TYPICAL FLOOR

COST AND CONSTRUCTION DATA

Date of Completion: November, 1928.
Total Number of Apartments: 10.
Total Number of Apartments per Floor: 1.
Total Number of Rooms per Apartment: 15.
Structural Frame: Steel.
Heating: Vapor.
Elevators: Electric.
Lighting: Electric.
Radiators: Cast iron.
Plumbing: Brass pipe.
Windows: Wood.
Trim: Wood.
Cubical Contents: 398,230 ft.
Cubic Foot Cost: 90 cents.
Total Cost: $358,407.

172 BEACON STREET, BOSTON.
BIGELOW & WADSWORTH, ARCHITECTS



TYPICAL FLOOR

COST AND CONSTRUCTION DATA

Date of Completion: January, 1925.
Total Number of Apartments: 5.
Total Number of Apartments per Floor: 1.
Total Number of Rooms per Apartment: 8.
Structural Frame: Wood.
Structural Floor System: Wood.
Heating: Vapor.
Elevators: Electric.
Lighting: Electric.
Radiators: Cast iron.
Plumbing: Brass pipe.
Windows: Wood.
Trim: Wood.
Cubical Contents: 96,560 ft.
Cubic Foot Cost: 86 cents.
Total Cost: $82,866.

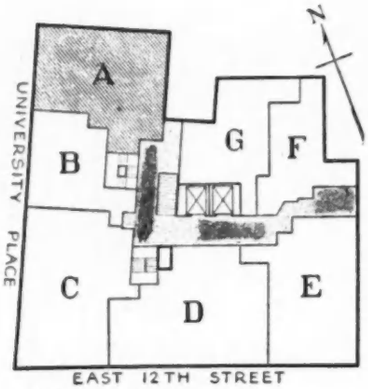
116 CHARLES STREET, BOSTON.
BIGELOW & WADSWORTH, ARCHITECTS

31 EAST 12TH STREET, NEW YORK.
SUGARMAN & BERGER, ARCHITECTS

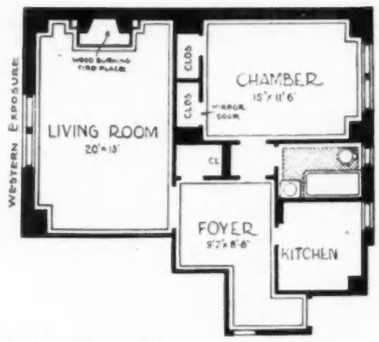
Nyholm & Lincoln

Wurts

400 EAST 58TH STREET, NEW YORK.
GEORGE FRED PELHAM, ARCHITECT

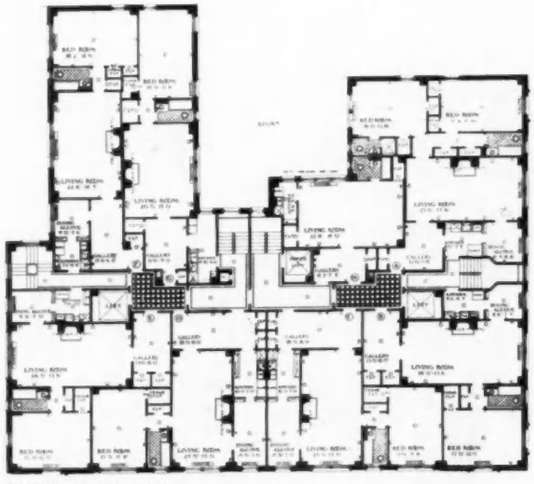


TYPICAL FLOOR



APARTMENT "A"

31 EAST 12TH STREET, NEW YORK.
SUGARMAN & BERGER, ARCHITECTS



TYPICAL FLOOR

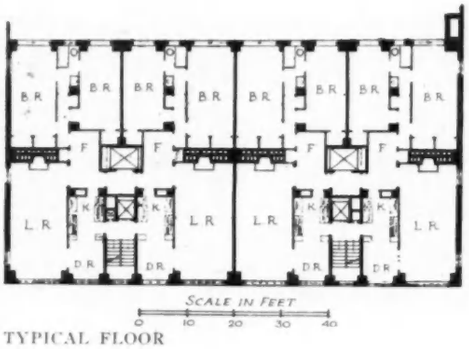
400 EAST 58TH STREET, NEW YORK.
GEORGE FRED PELHAM, ARCHITECT

325 EAST 72ND STREET, NEW YORK.
LEONARD COX, ARTHUR C. HOLDEN
& ASSOCIATES, ARCHITECTS;
ALFRED BUSSELLE, CONSULTANT

Tebbs & Knell, Inc.

Amemya

BEEKMAN MANSION, NEW YORK.
VAN WART & WEIN, AND TREANOR
& FATIO, ASSOCIATED, ARCHITECTS



TYPICAL FLOOR

325 EAST 72ND STREET, NEW YORK.
LEONARD COX, ARTHUR C. HOLDEN
& ASSOCIATES, ARCHITECTS;
ALFRED BUSSELLE, CONSULTANT

THIRD TO SEVENTH FLOORS

EIGHTH AND NINTH FLOORS

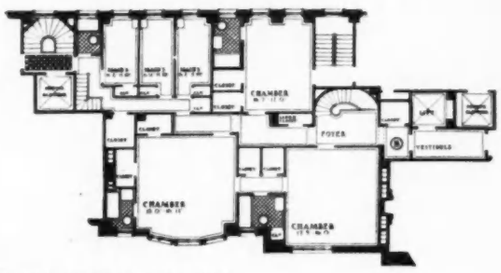
BEEKMAN MANSION, NEW YORK.
VAN WART & WEIN AND TREANOR
& FATIO, ASSOCIATED ARCHITECTS

ONE EAST END AVENUE, NEW YORK. PLEASANTS PENNINGTON AND ALBERT W. LEWIS, ARCHITECTS. McKIM, MEAD & WHITE, SUPERVISING ARCHITECTS

Van Anda

1001 PARK AVENUE, NEW YORK. PLEASANTS PENNINGTON AND ALBERT W. LEWIS, ARCHITECTS

APT. "B" DUPLEX

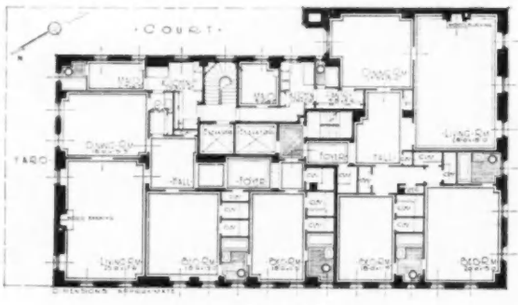


UPPER FLOOR APT. "B"

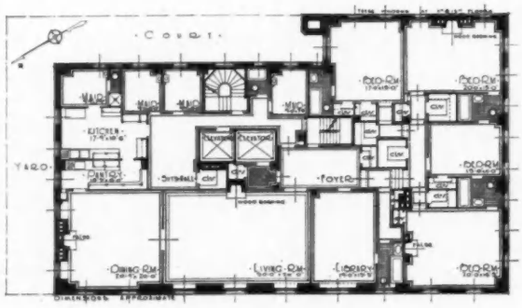
COST AND CONSTRUCTION DATA

Date of Completion: October, 1929.
Total Number of Apartments: 35.
Total Number of Apartments per Floor: 3, varying.
Total Number of Rooms per Apartment: 8 to 14, varying.
Structural Frame: Steel.
Structural Floor System: Cinder arch.
Heating: Vapor.
Ventilating: Ranges only.
Elevators: Electric.
Lighting: Electric.
Radiators: Copper.
Plumbing: Brass piping, hot.
Windows: Wood.
Trim: Steel and wood.
Cubical Contents: 1,375,000 ft.
Cubic Foot Cost: 90 cents.
Total Cost: $1,239,000.

ONE EAST END AVENUE, NEW YORK.
PLEASANTS PENNINGTON AND ALBERT W. LEWIS, ARCHITECTS; McKIM, MEAD & WHITE, SUPERVISING ARCHITECTS



3RD FLOOR



5TH, 7TH, 11TH AND 12TH FLOORS

COST AND CONSTRUCTION DATA

Date of Completion: October, 1929.
Total Number of Apartments: 16.
Total Number of Apartments per Floor; 1, varying.
Total Number of Rooms per Apartment: 5 to 18.
Structural Frame: Steel.
Structural Floor System: Cinder arch.
Heating: Vapor.
Ventilating: Ranges and special cases only.
Elevators: Electric.
Lighting: Electric.
Radiators: Copper.
Plumbing: Brass pipe.
Windows: Wood.
Trim: Steel and wood.
Cubical Contents: 835,600 ft.
Cubic Foot Cost: 82 cents.
Total Cost: $682,750.

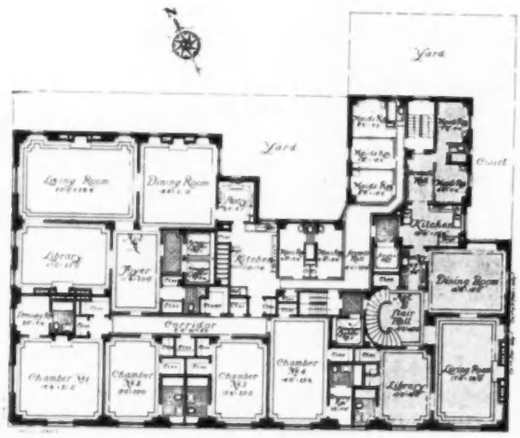
1001 PARK AVENUE, NEW YORK.
PLEASANTS PENNINGTON AND ALBERT W. LEWIS, ARCHITECTS

623 PARK AVENUE, NEW YORK. J. E. R. CARPENTER, ARCHITECT

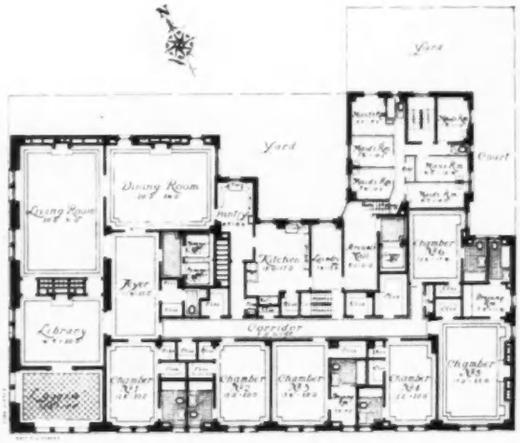
Knickerbocker

Wurts

856 FIFTH AVENUE, NEW YORK. WARREN & WETMORE, AND ROSARIO CANDELA, ASSOCIATED, ARCHITECTS



3RD, 5TH, 7TH AND 9TH FLOORS



11TH AND 12TH FLOORS

623 PARK AVENUE, NEW YORK.
J. E. R. CARPENTER, ARCHITECT

TYPICAL FLOOR

856 FIFTH AVENUE, NEW YORK.
WARREN & WETMORE, AND ROSARIO
CANDELA, ASSOCIATED ARCHITECTS

1020 FIFTH AVENUE, NEW YORK.
WARREN & WETMORE, ARCHITECTS

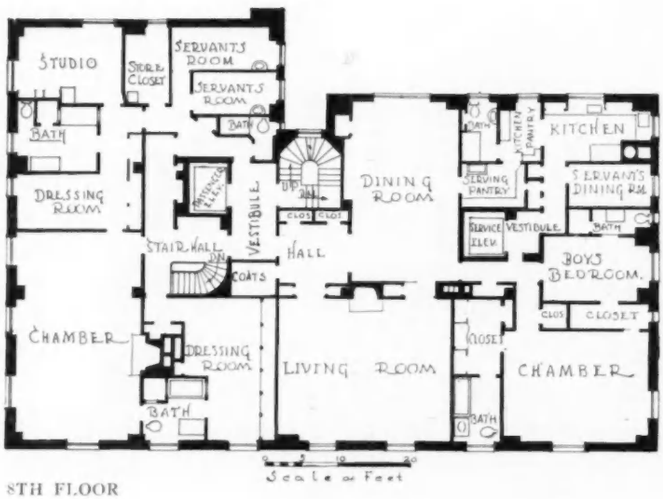
Wurts

660 PARK AVENUE, NEW YORK.
YORK & SAWYER, ARCHITECTS

5TH, 7TH, 8TH, 10TH AND 11TH FLOORS

6TH, 9TH AND 12TH FLOORS

1020 FIFTH AVENUE, NEW YORK.
WARREN & WETMORE, ARCHITECTS



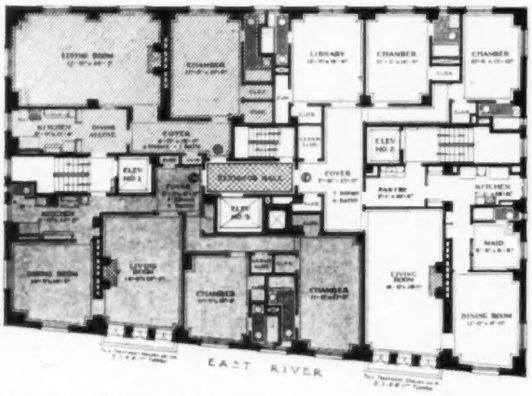
8TH FLOOR

660 PARK AVENUE, NEW YORK.
YORK & SAWYER, ARCHITECTS

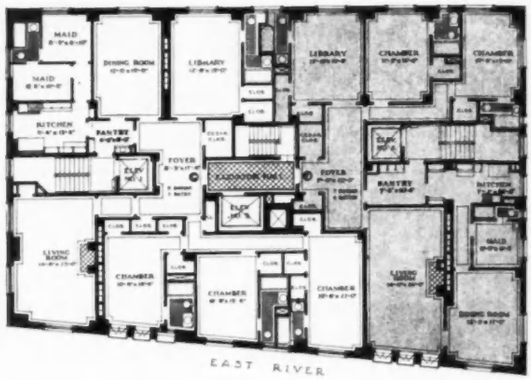
25 EAST END AVENUE, NEW YORK.
CROSS & CROSS, ARCHITECTS

Wurts

155 EAST 72ND STREET, NEW YORK.
CROSS & CROSS, ARCHITECTS

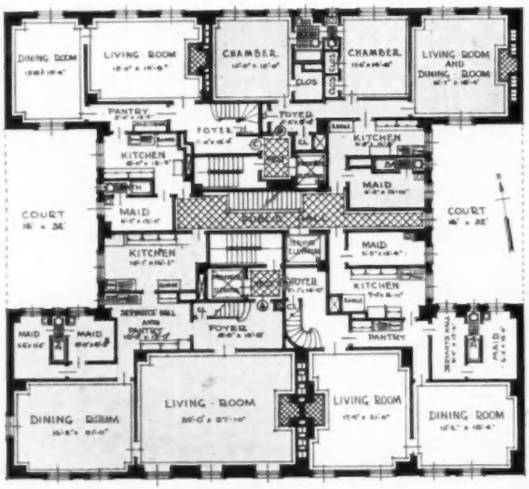


4TH TO 12TH FLOORS

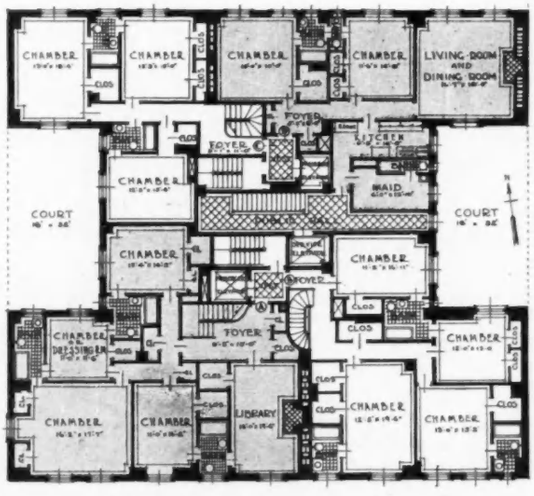


13TH AND 14TH FLOORS

25 EAST END AVENUE, NEW YORK.
CROSS & CROSS, ARCHITECTS



TYPICAL LIVING ROOM FLOOR



TYPICAL BEDROOM FLOOR

155 EAST 72ND STREET, NEW YORK.
CROSS & CROSS, ARCHITECTS

530 EAST 86TH STREET, NEW YORK.
CHARLES A. PLATT, ARCHITECT

Wurts

30 SUTTON PLACE, NEW YORK.
ROSARIO CANDELA, ARCHITECT.
PEABODY, WILSON & BROWN,
SUPERVISING ARCHITECTS

530 EAST 86TH STREET, NEW YORK.
CHARLES A. PLATT, ARCHITECT

30 SUTTON PLACE, NEW YORK.
ROSARIO CANDELA, ARCHITECT;
PEABODY, WILSON & BROWN,
SUPERVISING ARCHITECTS

SUBURBAN APARTMENTS

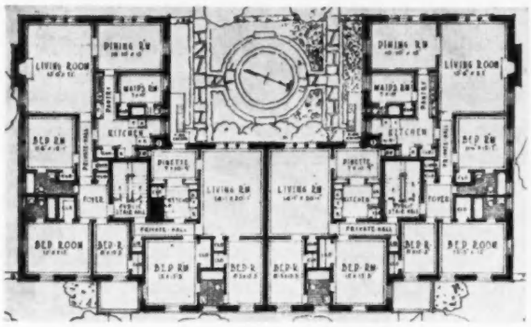
BY

PENROSE STOUT

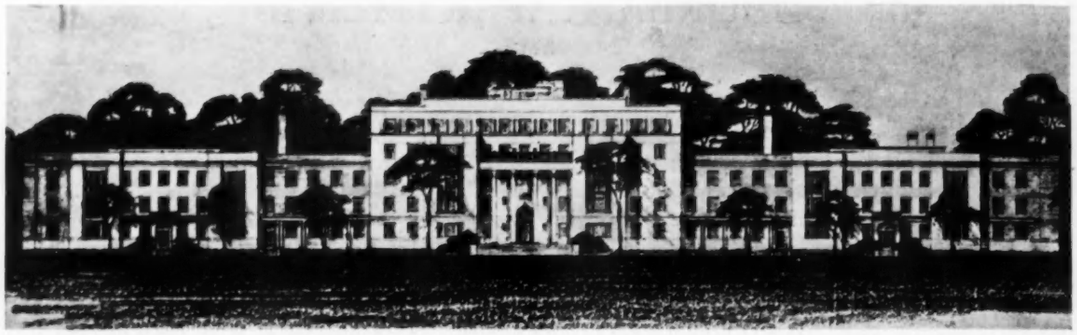
THE suburban apartment house is a matter of recent evolution. It is only in the last twenty years that any real progress has been made in the development of such multi-family groups of a definite suburban character. The movement began with the adaptation of old mansions to house several families. Alger Court, in Bronxville, New York, is reputed to be one of the first, if not the first of these adaptations, and it is significant that this has been fully rented ever since it was changed from the old Swain mansion into its present form. Definite attempts soon followed to design suburban apartment dwellings which would have the same advantages of fresh air, sunlight, and attractive landscape settings, as are concomitants of suburban private residences.

SUBURBAN ADVANTAGES

The reasons for the ever-increasing demand for the right kind of suburban apartments are obvious, but should be carefully borne in mind in approaching the problem of design. Improved railroad transit, new roads and parkways, and the multiplication of automobiles have all helped to increase the commuting population of the larger cities. The suburbs usually have good schools and they are free from the dangers of heavy traffic to which the children in city schools are exposed. Finally, there are the recreational facilities such as golf and tennis, bathing beaches and bridle paths, country clubs and open spaces, which are not found in urban centers. Hence, it is not surprising that people are being attracted to apart-



Exterior and Plan of Winthrop Hall, Bronxville. Penrose Stout, Architect



Pencil Sketch of the Apartment House at Bronxville, Called "The Colonnade." Penrose Stout, Architect

Below: First Floor Plan of an Apartment House at Bronxville, Called "The Colonnade." Penrose Stout, Architect

ment houses outside the city, providing these structures can satisfy the wants of their discriminating tenants. The advantages which they expect are more light and air, less noise, cross ventilation, and an attractive outlook—and all this at a rental below that which they would have to pay for the same number of rooms in town. Experience has shown that, in order to meet their expectations, the buildings should be set well back from the street, with attractively landscaped grounds, and ample provision for both parking and housing automobiles.

HIGH UNITS DESIRABLE

That these conditions can be fulfilled on a financially profitable basis is due, of course, to the lower cost of land in suburban areas. It is doubtful whether enough advantage of this fact has been taken, and it might be mentioned here that such advantage does not necessarily preclude high apartment units. There is much to be said in favor of suburban apartments of six or more stories, provided the coverage of the site is limited proportionately. The upper floors gain in light and air, and every tenant has the advantage of an increase in the surrounding garden space.

LAYOUT AND OUTLOOK

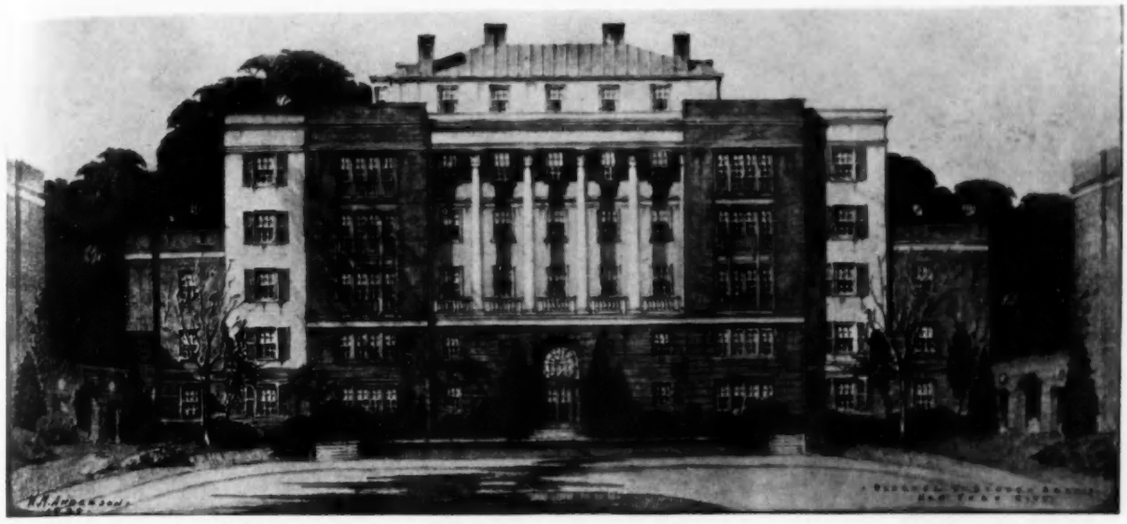
To insure a low rate of vacancies, which is essential for a fair return on the investment, a suburban apartment house should have in abundance the advantages that building in the suburbs makes possible. Zoning regulations have undoubtedly helped to encourage open types of apartment houses, but a limited coverage does not completely solve the problem. The garden spaces must be effectively arranged so that each apartment in the building may have a pleasant outlook.

MODERN EQUIPMENT INDISPENSABLE

We are witnessing today the introduction of new devices for use in the home and apartment in unprecedented numbers, and their advantages are advertised more cleverly and alluringly than ever before. The people who never heard of colored bath fixtures, chromium finish, incinerators, electric refrigeration, electric dishwashers, steel cabinets, folding ironing boards, Vita glass and concealed radiation, until a few years ago, are now made to believe that they are indispensable. The apartment houses built before their advent and adaptation are considered "out-of-date." Certainly they are features of large attraction, and their effect has been to create a tendency among the tenants to become more and more transient, causing the owners grave concern. To combat this tendency it is necessary to look well ahead and give ample consideration to modern equipment, but equipment which is modern today is out of date tomorrow. It is, of course, important that such properties be kept abreast of the times to retain their attractiveness, but it is frequently impossible for physical or financial reasons to provide every new modern appliance.

PLAN AND DESIGN

If basic features of plan and design are wisely and generously provided in the beginning, they will go a long way toward satisfying the tenant. He is not so apt to be lured to a fresh new apartment



"The Georgian,"
Bronxville, New York.
Penrose Stout, Architect

Below: Plan of "The Arches,"
Bronxville, New York.
Penrose Stout, Architect

with some more recent equipment if the ventilation is not so good, the plan not so convenient, the rooms not so large, or the buildings not so characterful and dignified as the one he now occupies. Experience has demonstrated that narrow units, about thirty-three feet wide, are advantageous in suburban multi-family dwellings, as this facilitates a design with none of the apartments more than two rooms deep, thus insuring cross ventilation. The narrow units require more exterior entrances, but long public halls are made unnecessary. By placing the living room near the entrance to the apartment, with the bedrooms beyond, a real economy of hall space is achieved. Plenty of light and ventilation is assured to the main rooms if the dining room and living room, having opposite exposures, run through the width of the buildings.

VESTIBULES AND ENTRANCE FOYERS

It is particularly important in suburban apartments to avoid small, poorly lighted vestibules. This first impression is important and is frequently taken as an index of what lies beyond. It seems well to be lavish at this point, for although no one rents the entrance or the vestibule, yet they reflect very directly upon the apartments they serve, and since they serve several apartments we can afford to treat them well and obtain those qualities of dignity, distinction and charm that one might expect to grace the main entrance of a country home.

DEMAND INCREASING

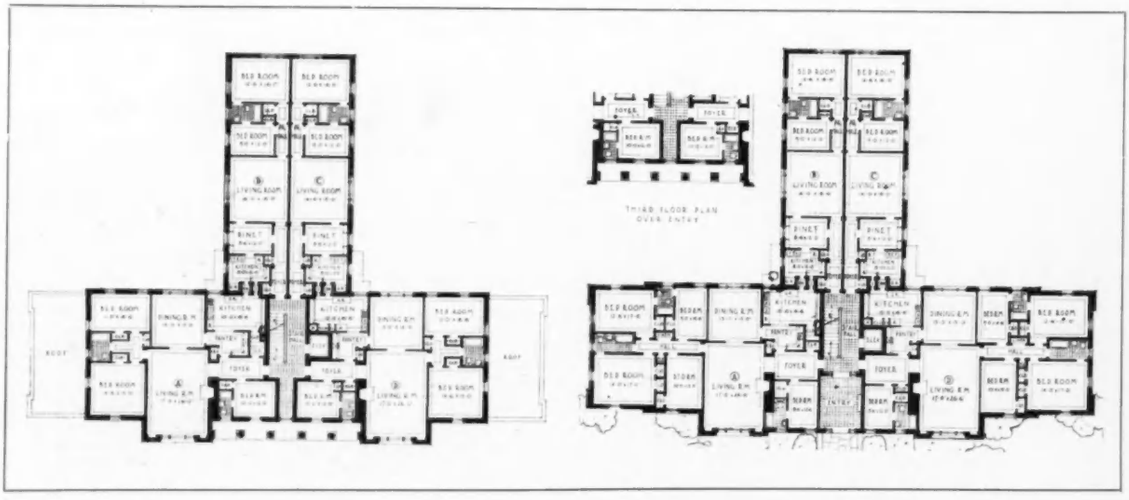
There can be little doubt that the demand for suburban apartments will continue to increase in number as our business centers become more densely occupied and our cities less attractive places in which to live. Life, both business and social, is becomming increasingly complex, and the servant problem adds its trials to further develop this urge on a large part of the public for a more simplified home life where care, maintenance and responsibility are left to the landlord.

ADJACENT PROPERTY OWNERS MUST BE CONSIDERED

Too many apartments have been built in the suburbs without regard to environment and effect on adjacent property. Desirable residential property has too frequently been blighted by apartments of poor character crowding their boundaries. This has often resulted in public disfavor and condemnation of all apartment houses in

James Owen
Detail of "The Colonnade."
Plans of "The Georgian"

James Owen
"The Arches," Bronxville.
Penrose Stout, Architect



their community. But apartment houses will come, forced by population pressure, increasing property value and taxation. So it behooves us to reconcile our communities to their advent by intelligent forethought and direction. Architects can serve in this regard by helping to create well devised zoning ordinances and building ordinances in the suburban communities and by influencing the individual owner to build creditably and in sympathy with his environment. The field is large and because it is comparatively new, it offers the architect a stimulating opportunity to express himself originally and to help preserve and enhance rather than disfigure and destroy the charm of our suburbs.

The stock market slump last fall, with its subsequent business depression, put an end to the hasty over-production of apartment houses that was taking place on the outskirts of our larger cities, and it is to be hoped that wiser councils and better judgment will prevail when money for real estate improvement becomes again available. It is believed that investors and mortgage companies have learned the necessity of exercising a more careful discrimination in approval of buildings on which money is to be loaned.

OPPORTUNITY IN THE GARDEN APARTMENT

BY

JOHN TAYLOR BOYD, JR.

WITHIN the past ten years the garden apartment has come to the fore as one of the important classes of American buildings. Whether this is likely to continue is an interesting question. I believe that the answer is in the affirmative. There is good reason for believing that conditions and tendencies in the real estate field today offer excellent opportunities for the garden apartment type in the years immediately ahead.

SUPERIORITY OF GARDEN APARTMENTS

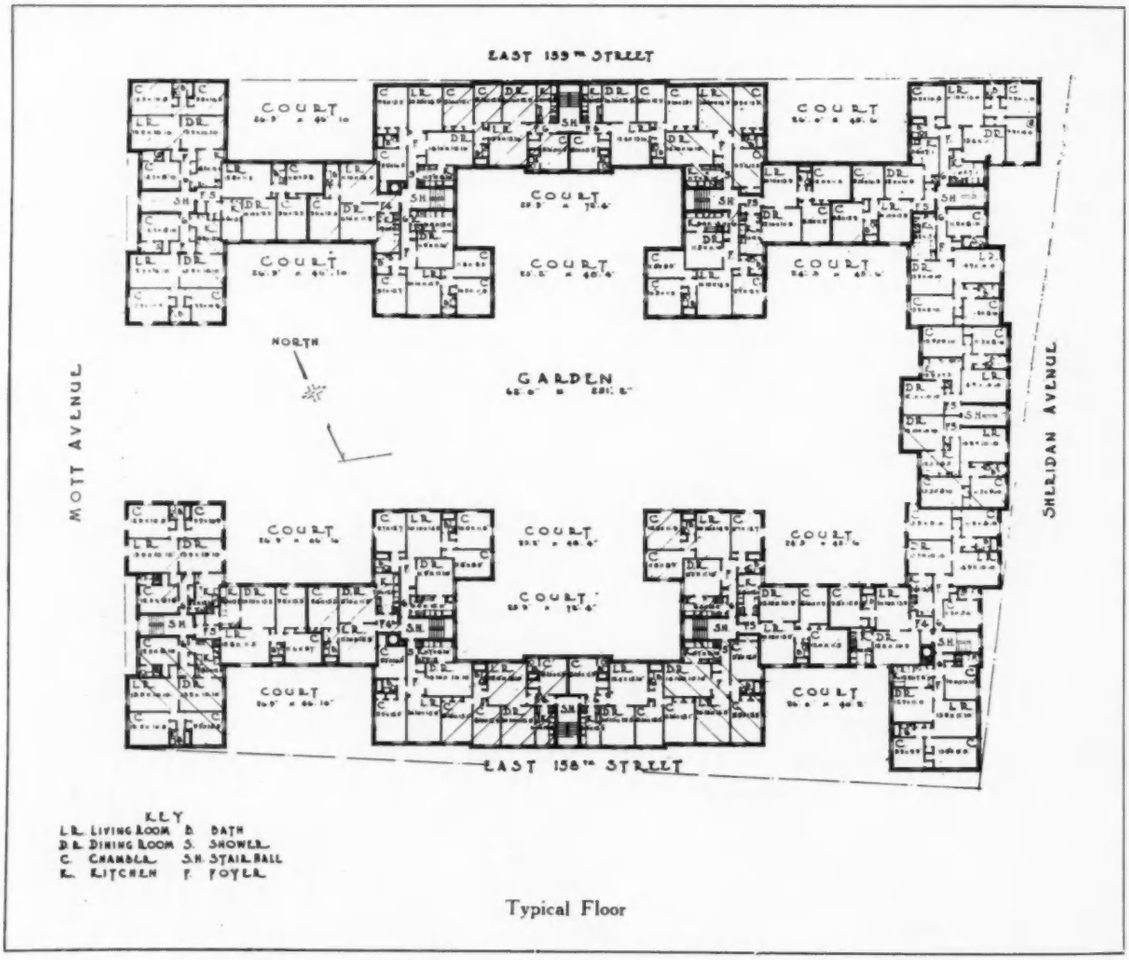
Experience with the garden apartment has proved rather conclusively that it has marked superiority over the two competing classes of residence buildings,—the individual house, either of the detached or the row type, on the one hand, and on the other hand the old fashioned congested apartment house that is built as solidly up to the building line and to the property lines as law will allow. As regards the first competitor, it is noteworthy that the trend toward apartment house living has set in, stronger than ever during the last couple of years, as statistics of new construction show. This appears to be true all over the country, even in those cities where authorities once declared that people would never forsake their individual homes for apartments. But householders, particularly young married people, prefer the greater conveniences of an apartment and the central location that is likely to go with it, to say nothing of its greater economy. People also wish to have as much as is practicable of the amenities, and with the beauty and the openness, light, garden surroundings and the outlook that characterize the detached house in mind, they naturally prefer the garden type of apartment. So much for the point of view of the renting public. From the viewpoint of the promoter or investor, the garden apartment has in general superior investment value over either the older apartment type or the individual house. Thus, it is likely to be the easiest type to finance. I believe that mortgage interests are recognizing this fact.

Another significant trend favors the growth of the garden apartment idea. There is the increasing tendency,—in New York at least,—toward the large unit of operation as being the most economical. In residence building the most economical unit is felt to be a city block or more. Among real estate experts, builders and mortgage interests as well as architects, there is a growing understanding of the fact that the advantages of the large operation are so great that it is the "coming thing," and the "only thing," in many cases in this present buyers' market in real estate. This opinion is being supported in practice. For

Van Anda

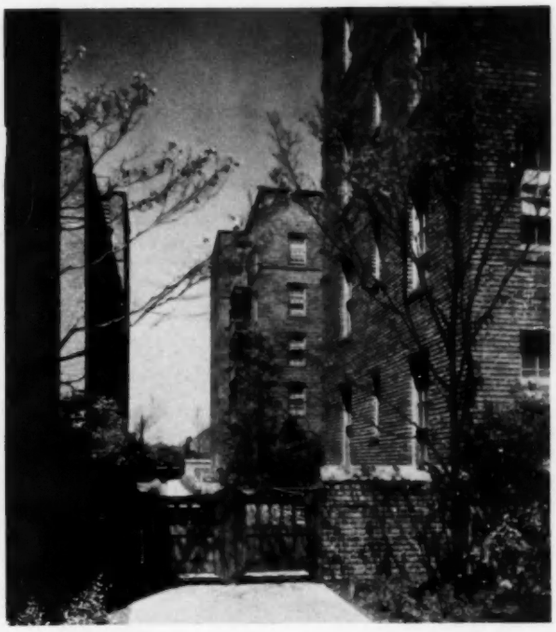
Thomas Gardens Apartments, New York
Andrew J. Thomas, Architect

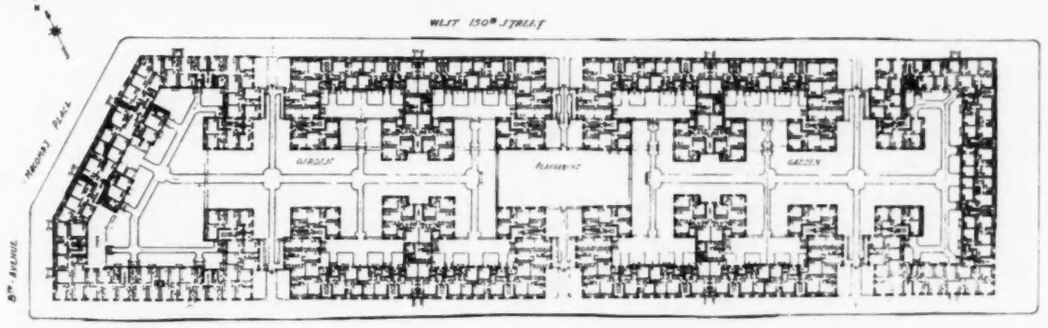
Van Anda



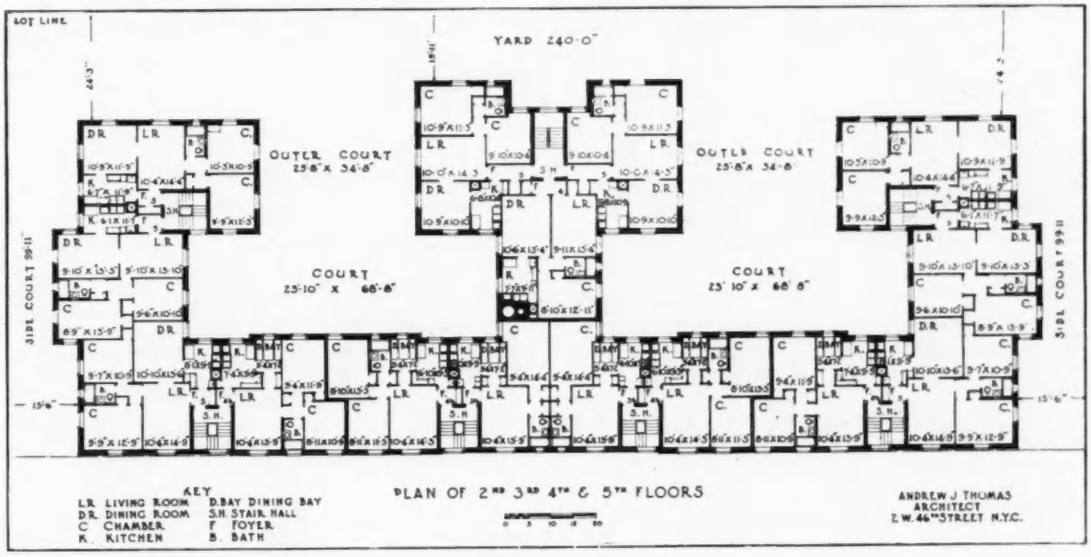
Typical Floor

Thomas Gardens Apartments, New York
Andrew J. Thomas, Architect

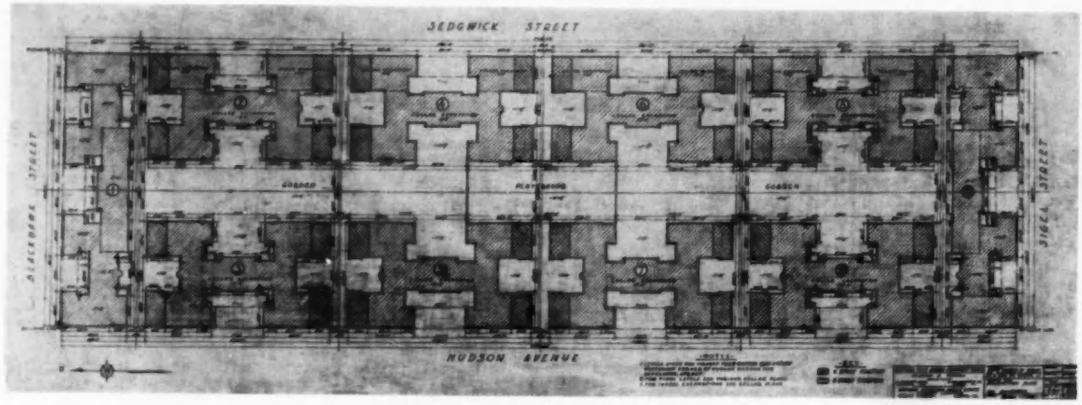




Plot Plan

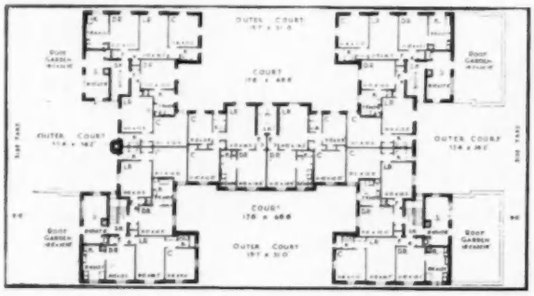


Dunbar Apartments, New York
Andrew J. Thomas, Architect

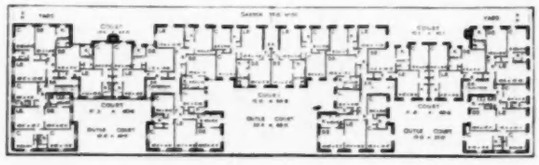


General Plan

Typical Center Building



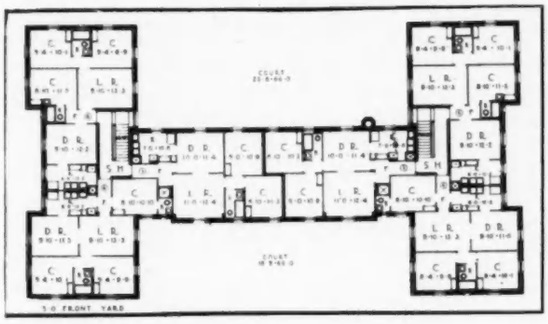
End Buildings



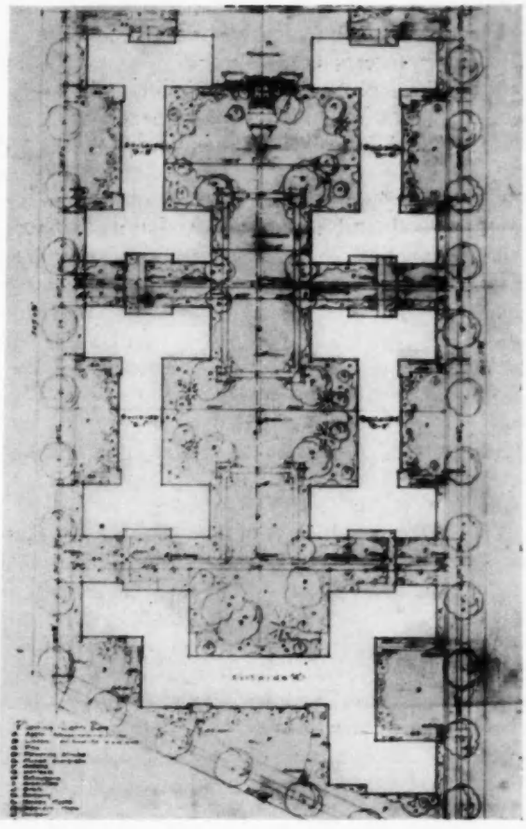
Marshall Field Garden Apartments, Chicago. Andrew J. Thomas, Architect. Graham, Anderson, Probst & White, Consulting Architects

Van Anda

Apartments for the Bayonne Housing Corporation, Bayonne, N. J. Andrew J. Thomas, Architect



Typical Floor Plan



well over a year in New York the activity in real estate trading, promotion and construction has centered more and more in the hands of about a dozen of the largest organizations, who appear to be very active on a huge scale, doing volume business in the largest possible units. Most of them are of the type of strong public real estate, —financing,—construction companies described in the articles published in THE ARCHITECTURAL FORUM last year, entitled "Wall Street Enters the Building Field." In this buyers' market these strong companies are more active, and they are expanding faster than ever before, if one may judge from the frequent reports of their operations in the real estate news sections of the press. It is an apt illustration of the economic

principle that the test of an organization is its ability to make hay while the sun does not shine. A few of these concerns are reported to have been buyers of residence properties. The point to be noted here is that almost inevitably the huge operation, comprising one or more city blocks, means the use of the garden apartment type. In a buyers' market one must offer goods of better quality than the other fellow's and at a lower price. In other words, why not produce the garden apartment type?

ADVANTAGES OF LARGE SCALE OPERATIONS

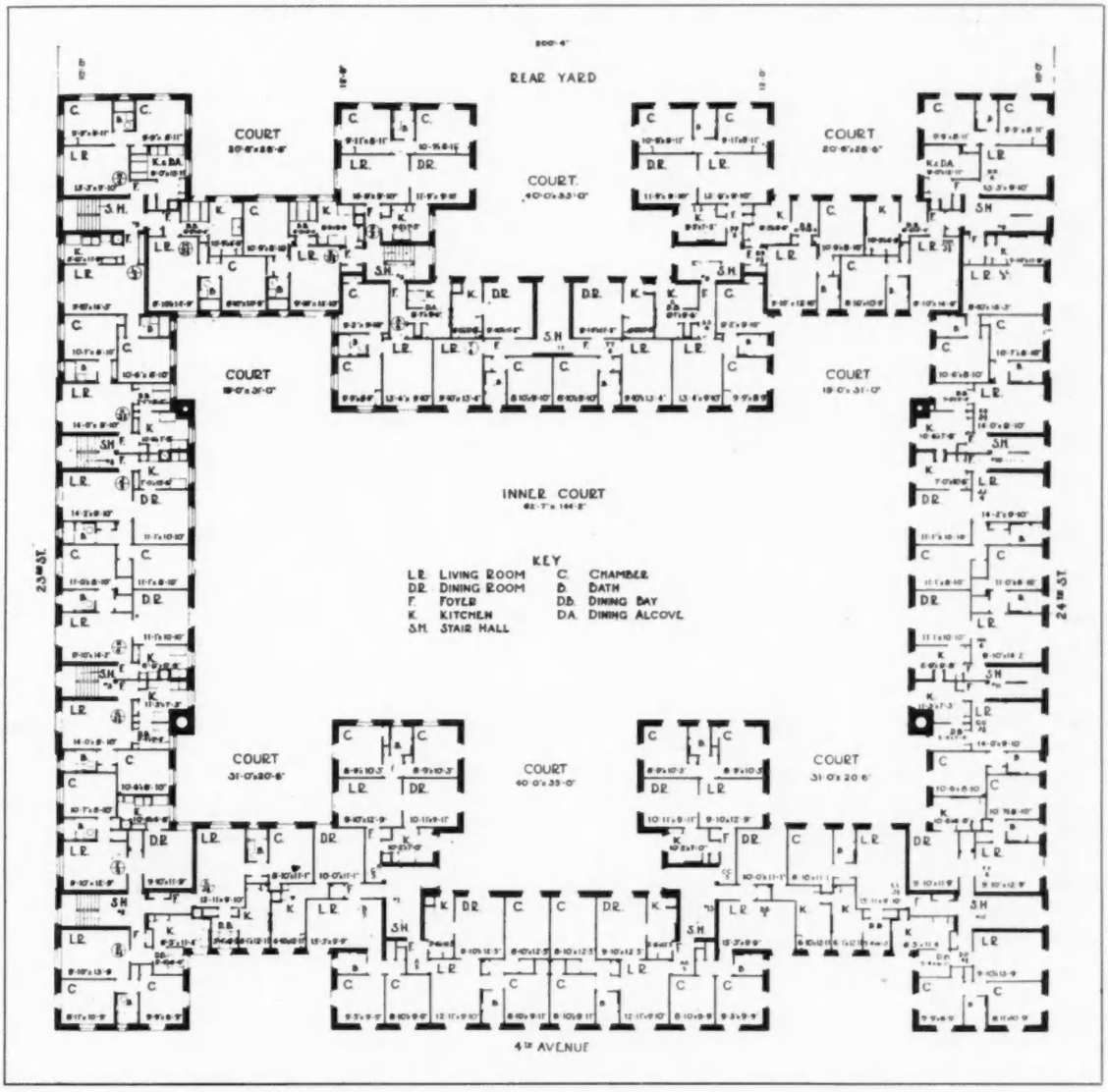
The large scale of these operations and their low-cost financing of equities and junior mortgages together make possible the lower price to the public; and the large plottages assembled furnish opportunity for the garden plan layout. With the garden layout there may be created a sort of monopoly of the sales appeal attractiveness and of the new, improved standards that lie so close to the heart of Americans. This superiority, in the competition of a buyers' market, may attract tenants out of older buildings, thus rendering them prematurely obsolete, gray-haired before their time. In this present economic situation there is also to be considered the important phase of land values and site prices. Hitherto the chief handicap to the rise of the garden apartment to an important position among the most widely used types of American bui'dings has been the inertia of the building industry and its allied interests who felt that it was too difficult and too costly to purchase enough land in a given operation to allow the garden type. In a sellers' and speculators' boom market, this was thought to be a waste of good money. For, in the post-war housing shortage, would not almost anything sell and rent, even apartments having a large proportion of dark, poorly ventilated rooms, drab surroundings, and badly planned houses? On top of this reluctance was there also not failure to understand that small sites with maximum coverage of building usually involve a heavy loss of efficiency in the plan of the building itself as compared with very large sites with buildings of low coverage, a loss so great that high coverage does not often pay on an investment?

FALLACY OF HIGH COVERAGE

This fallacy of high coverage still persists, notwithstanding all that has been written in disproof of it in the architectural journals during the past two years. Therefore one more illustration may be of interest. It happens that with Arthur C. Holden and Associates, I am consulting architect of the East Side Chamber of Commerce of New York. This organization is taking an active leadership in promoting the rehabilitation of that admirably located district on the edge of two of the greatest business centers in the world, but one which is today in a sad state of blight due chiefly to the obsolete buildings of all types which cover the district solidly. The purpose of the East Side Chamber is to encourage builders to come into the district and rebuild it, chiefly with residence structures, thus making it one of the most attractive and valuable sections of Manhattan, as it unquestionably should be. For more than a year my counsel has been against the undesirable development of the small "shoe-string" operator. I have pointed out that his typical building with narrow frontage is too small to effectively change the neighborhood in the way that the huge "Tudor City" development, comprising several city blocks at the end of East 42nd Street, Manhattan, changed a similarly blighted district into one of the best. On the lower east side the small operation is likely to fail, and in failing it begins another slum. This view, I believe, is finding favor in mortgage circles.

ECONOMY OF THE GARDEN PLAN

Nor should it be thought that this situation on the lower east side is an isolated case. Nearly every one of the older large cities of the United States has similar blighted districts on the edges of the finest business or residential centers, where land values are comparatively low, inviting profitable reconstruction with new buildings. Here is one of the finest opportunities for the building industry that could be found. But the work must be done in a large way, and on sound principles. A striking example of the economy of the garden plan came to my notice recently in this connection. A builder had a plan for a medium-priced, six-story elevator apartment house, on an inside plot with 80 feet frontage, 20 rooms to a floor, coverage nearly 70 per cent of the property. I compared it with a plan that we had drawn for a whole block, 600 x 190, covering 55 per cent and with somewhat larger rooms, every one with fine outlook over either street or huge interior garden, running almost the full length of the block. Now, the first plan showed an average of 4 feet of street frontage for each room per floor, whereas, the garden apartment plan showed 4½ feet of street frontage per room per floor,—apparently a difference of 12½ per cent in favor of the high-coverage plan; but when it is understood that in the small congested plan there were two small apartments with four of the 20 rooms with low rental value because they were located on small side lot line courts, and also that the eight rear rooms were located on a very narrow yard with a shut-in cheerless outlook, it will be seen that the large block, low-coverage plan has actually a higher number of good rooms per front foot than the



Brooklyn Garden Apartments. Andrew J. Thomas, Architect. Frank H. Quinby, Associated

small plan has. The superior efficiency of the lower-coverage plan in this particular comparison has, be it noted, no reference to land values. In addition, there was considerable extra expense involved in the small plan in the long public corridors necessary to provide access to the single elevator. These were absent in the other plan.

Of course, when a small builder is shown these facts he may reply: "I see the point all right, but I haven't enough capital to go into a larger operation." Equally, of course, when you suggest that he combine in a group with other small builders who, like himself, wish to enter the district in a small way, to carry out a large operation and split the risk, you find that he is too much of an individualist to welcome the suggestion. But that sentiment will pass, particularly when the small builder gets the same advice from mortgage people, as now seems likely.

THE CHIEF OBSTACLE TO GARDEN APARTMENTS

Here we come to the main obstacle to the progress of the garden apartment idea. This is the small property owner. As every one who has ever tried to assemble a large plottage knows, it is the small property owner who often balks the project in one way or another. But even here there is prospect of improvement. There is to be detected the beginning of a realization that under the complex conditions of a large city the holding of real estate in small parcels is becoming uneconomic. It is risky business for the small holder as well as for the building industry. The practice is a relic from the days when real estate afforded one of the few avenues open for small investments. But it is getting to be precarious for the small holder to hold a small parcel, mortgaged up to the neck, as it often is, and his thin equity is easily wiped out in the swift changes in real estate conditions in a city, with the danger of being "closed in" to provide a light shaft for the large operation next door, along with the prospect of meeting one or more of those huge unexpected assessments for the colossal modern improvements of the city which may add value eventually to his little property, but which it may be impossible for him to finance in the interim, thus forcing him out. There are other reasons, too, not the least of which is the aforesaid buyers' market. In the building industry there are found many individuals who entertain quaint notions of economics. One of these myths is the idea that land values always rise, on the principle that trees can grow to heaven. This theory of the permanent bull market in real estate, as in securities, is possibly not so popular now as it was a while back. It is interesting to note that twice within the past nine months when I remarked to a real estate expert, who is a partner in a well known Manhattan firm, that liquidation in site values was inevitable, I received the identical reply: "Of course, in the best residence section of Manhattan they have pushed prices up so high that only the most expensive coöperative apartments can be built on them. And the market for that class of goods is extremely limited,—much smaller than the supply of un-built-on sites."

After all, the value of a site is based on the earning power of the building erected on it. As changes in market demand for buildings affect their earning power one way or another, so does the value of the site change similarly. Eventually, the owner of the site must change his price to agree with its altered value. Thus, the trend toward the larger operation, no matter what class of building is involved, cannot be stopped by arbitrary notions of fixed or rising land "values." The garden apartment should benefit increasingly.

GREAT IMPROVEMENT IN EQUIPMENT

In conclusion, it may be said that the standard of design, construction and equipment of the garden apartment is always improving, and this makes it additionally attractive to the public. The record of these improved standards is constantly registered in great detail in the architectural journals, and it needs no careful explanation here. One tendency, however, may be noted. In the New York district, at least, the public demand even in the cheapest housing is for elevators in apartments that are more than four stories high. People will not pay enough for the privilege of walking up above the fourth floor to make a "walk up" of five or six stories profitable. Not only that, but there appears to be enough social distinction associated with living in an elevator apartment house to make those who rent the lower stories willing to pay a higher rental on account of the elevator for which, as a matter of convenience, they have little need. Such are the reasons for believing in the future of the garden apartment,—the garden apartment of all types and classes and prices and heights, and walk-up and elevator and land prices.

PARIS APARTMENT HOUSES

BY

KENNETH M. MURCHISON

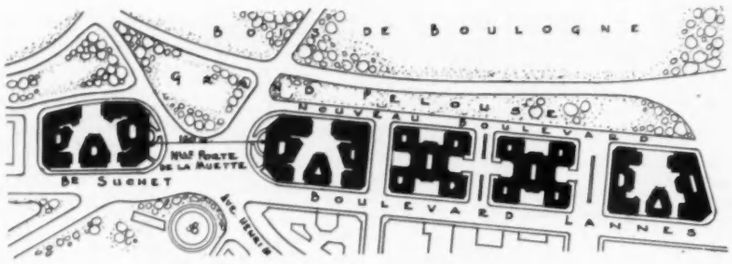
IN Paris, the city of charm, the city of beauty, the largest and most interesting group of apartment houses in the world is now in course of construction. The immensity of the thing is amazing, and the site, immediately facing the beautiful Bois de Boulogne, is without parallel.

The long line of fortifications, long since abandoned, situated at the Porte de la Muette, was for a long time intended to be used eventually for *hotels particuliers,* or private homes. But private houses are now a thing of the past. Apartments have taken their places. Rarely is one invited to a *hotel particulier* in Paris. Only the old families have them, and if you are a house guest and you want to take a bath in these aristocratic surroundings, you have to wait in line with your towel and your soap, praying that the one ahead of you is a quick washer!

Everyone in Paris, as in New York, is headed straight for apartment life. As land values soar, so do the private houses, and in inverse ratio, as it were, hide their heads in embarrassment, for it isn't the fashion these days to blazon forth one's riches and one's successes, and the private house certainly gives to the critical world that holier-than-thou appearance. And, of course, the servant problem is ever present, even in Paris, although domestic servants are much easier to find in Paris than in the United States. But the difference in wages would make you positively cry like a child. In New York, for instance, we pay a cook, generally of Irish or Scandinavian extraction and almost always without any knowledge whatsoever of the art of cooking; yes, we pay these ladies $100 or $125 a month. In Paris they pay them $20 and for a *cook* too,—not the imitation variety, but a really good chef, a cook who knows her onions and whose productions leave a haunting memory of zip and relish.

But back to our architectural subject. The municipality of Paris held a competition on December 30, 1927, for the first of four great groups of apartment houses on the site of the abandoned fortifications at the Porte de la Muette. It was a marvelous piece of property, facing the Bois and surrounded by gardens on all sides, by avenues hundreds of feet wide, by towering trees and by attractive *hotels particuliers.* This competition called for a group of buildings covering 131,000 square feet, or by our calculation, an entire New York avenue block 200 feet wide, running back some 650 feet, a piece of property as large as that of the new Waldorf-Astoria Hotel, which will occupy an entire city block on Park Avenue. But there was a severe restriction on the property, that of height. The total was 60 feet facing the park and avenues and 72 feet on the interior gardens of the group. The height could not be greater than four stories above grade on the building line, *but* a fifth story was permitted if set back 20 feet. The object of these covenants was two-fold: first, to have a low and picturesque setting around the Bois; secondly, not to interfere with the view of the Bois from the existing buildings on the opposite side of the avenue.

The competition attracted some 50 entrants. The successful architect was M. Jean Walter, a graduate of the Ecole des Beaux Arts about 1902 and a designer of wide experience and great ingenuity, already noted for his apartment houses. His scheme comprised three buildings opening onto a central garden and containing 68 apartments, all of ample size and some of grandiose



A Group of Apartment Houses at the Porte de la Muette, Paris. The One to the Left is Finished. The First Building Opposite is in Process of Construction

dimensions. Terraces and roof gardens are here in abundance; in fact the Paris architects no longer put the servants' rooms up on the roof. M. Walter has arranged that all his kitchens, servants' bedrooms, guest lavatories and stairways are lighted and ventilated by large service courts, and every master's room and every entertaining room opens directly on the gardens.

This plan has been ingeniously arranged in M. Walter's scheme, but in certain instances he had to arrange the service to the dining rooms across the passages leading to the bedrooms. He evidently reasoned it out that it was more important to have the salon, the *petit salon* and the dining room open en suite, all with outside exposures (even if it did necessitate serving across the bedroom corridor) than to have the dining room face the court. With us, the dining room is the least important of the master's rooms, but in Paris, where lunch is an affair of perhaps two hours, a desirable outlook is necessary. The arrangement of servants' rooms in this plan is to us peculiar. Around the service court on each floor there runs a glass-enclosed gallery leading to a battery of servants' rooms, as many as 19 in one case. These are available for any or every apartment on that floor. One water closet is provided on each floor, and each room has a lavatory. Downstairs on the court side there is located an extra group of servants' rooms with a large bathing outfit such as is seen in a club house. One *monte-charge* or service lift is considered sufficient to lift the maids and the supplies, but with us it would hardly be considered ample.

You planners all know that if you have this ideal arrangement of every master's room and every service room on the court, and if you have your living rooms together, with the adjoining apartments served by the same elevators, you simply *have* to cross your hall from the pantry to the dining room. The objections to the plan are obvious. In the first place, if Emile is cooking Brussels sprouts or spring lamb with garlic, every time the butler opens the door a great whiff assails the fine French nostrils of the guests. Then again, the children playing horse races in the corridor (which is the *very* place for such a thing) are likely to try to run between the footman's legs while he is bearing away the discarded soup plates, in imitation of a machine gun being attuned to the propeller of an airplane! However, you can take your choice,—a somewhat dark, a somewhat noisome outlook on a court, with no smells on the outside, or a garden outlook with the mentioned indelicacies in full force. For me, I believe I would use M. Walter's plans, chain up the children, and let the cocktail shaker soothe the olfactory nerves of the guests into peaceful acquiescence.

The plan of this group is really most ingenious, —and complicated. In the first place, there are few, if any, right angles in the property. Then again, it was important that none of the principal viewpoints should be given up to the service. The presiding geniuses of the kitchen over there do not have the exalted social position of our kitchen mechanics. The apartment buyers or lessees in Paris demand very high ceilings in the main rooms, so M. Walter has given them 13 feet in the clear, a height which to us, even in the higher class of apartment houses, is a bit unusual. He therefore had the opportunity of making the servants' rooms and kitchens, all on the court, of less height, staggered with the main story levels. That made it again more complicated, as to both stairways and lifts.

The stories are arranged thus: on the outside, four stories above grade with an additional setback story; below grade one basement, lighted by areas and used for laundries and service rooms; underneath the entire garden and buildings there is a garage for 250 cars, so that each apartment owner may have space for three or four cars. This convenient and logical arrangement is not permitted by our laws in New York. On the court side (the grade of the court being lower than that of the street or garden) there are nine stories of servants' rooms and kitchens, with the garage in the sub-basement. On the outside, besides the four stories and the setback story, the municipality allowed the architect to add four or five towers of one story each. These belong to the setback stories, which, with their gardens and terraces overlooking the Bois, are naturally the most desirable apartments, although not the largest. The architect himself has taken one of these, and

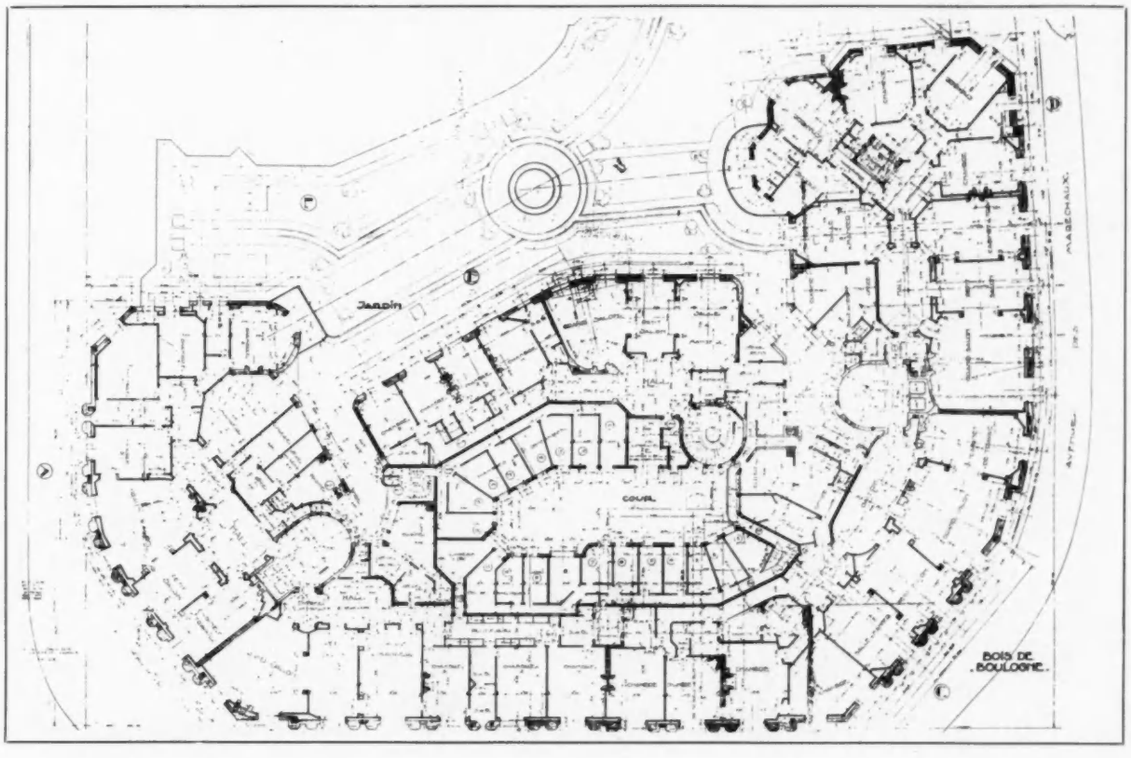
logically he ought to know something about it.

The facades are very simple and modern in style, of stone and without a cartouche or a garland on them. The construction is of reinforced concrete with extremely thick walls, not only on the exterior but in certain interior portions as well. M. Walter has designed great windows and exterior doors leading onto balconies, of a single sheet of plate glass sliding back into these thick walls by means of a special mechanism, thus opening the entire end of the room to the beautiful view and air of the Bois. Thus has a French architect abandoned French doors, French cartouches and a lot of other French specialties. He was in New York last year looking over a lot of our apartment houses (I had the pleasure of being his official guide), and who knows but what he picked up here and there a couple of Yankee ideas?

No apartment house architect of today is interested to a great extent in the elevations. Indeed, one of our most talented designers built an apartment house on East 79th Street in New York recently, and the fenestration has nothing to do with itself or with anything else. Every apartment in it was speedily sold, and it was supposed that the architect said "Here are the columns and the elevators and the stairways. Do what you wish with the design; hew to the plan, let the windows fall where they may!"

But a succinct explanation of the plan of this first unit of the development on the site of the fortifications may not be unpleasant reading. Our diagram shows three separate buildings, A in the center, B on the left, and C on the right. To the right of C is the Porte de la Muette, 500 feet wide, and on the other side of this opening will be located the second unit of the four designed for this development. It is truly a magnificent site, just as if some one of us had a proposition to build a group of apartment houses on Fifth Avenue, running from 72nd Street to 85th Street! If anyone of us got a commission like this, we just wouldn't notice anybody who spoke to us!

But on with our plan! Unit A has three apartments on a floor. The smallest happens to face the Bois, because it is the snub nose of a plan which resembles a 75-millimeter shell, if you gather what is meant. One elevator and one monumental curved stairway serve this apartment, which has six master's rooms and two baths. The two larger apartments in Unit A have nine master's rooms and four baths each. They are served by a semi-circular stairway lighted from the court, with two elevators side by side. This arrangement is very desirable in any country where people give parties. And, by the way, you all know that Paris elevators go *up* but they don't go *down*. That is, if your apartment house contains a lift that will take passengers down, you tell everybody about it, you're so proud. But then nobody in Paris will trust themselves to go *down* in an



elevator. They're not used to it, and it gives them a sinking spell.

These three apartments, totalling 24 masters' rooms on a floor, also include eight servants' rooms on a floor; or, there being nine servants' floors to five masters' floors, each floor of three apartments has about 14 servants' rooms to divide up among the three. Bear in mind, of course, that these apartments represent all that there is of the most *chic,* the most smart and the most desirable in Europe. Unit B has five apartments on a floor, two lifts, each serving two apartments, and one lift serving the smallest. The larger apartments run nine or ten rooms with three or four baths, and the smallest eight rooms and three baths. For these five apartments there are allocated about 22 servants' rooms. This unit has one inside service court and two narrow outside courts. Here and there kitchens and pantries are lighted by *courettes* or light shafts of fairish size. Unit C contains five apartments on a floor, two lifts serving two each and the remaining lift serving the odd apartment. The apartments in this unit run from nine to eleven rooms each and from three to four baths. Thirty-four servants' rooms go with these five apartments.

The number of rooms given include kitchens, servants' dining rooms and sewing rooms, but do not include the galleries or pantries or any inside rooms. The bedrooms rarely have closets, these being provided in the corridors or in the entrances to the bathrooms. I had quite a discussion with the architect over this point, but the only reason he gave, besides that of objecting to so many doors in a room, was that French families of wealth have so many more servants than do the American families of even more wealth, that there is always a servant handy with a pair of trousers hanging over his arm or in his hand the necktie you don't want. The theory is all right, but suppose you were in a hurry, with no trousers on, and the valet was dining, and the closet was way down in the corridor, and you weren't sure which closet was which—. Of course, I didn't argue with him over the point, but nevertheless I felt strongly about it. However, I am very polite,—in Paris. Just the same, I can't help thinking about the things that might happen to me if my closet were in the hall! I am like a fireman, but without the greased pole, but the French are never in a hurry, except when they are getting out of the way of four thousand taxicabs going in different directions in the Place de la Concorde!

The plan of this group is a cock-eyed plan. The property is cock-eyed, and hence the cock-eyed plan. The rooms are thus necessarily cock-eyed, but M. Walter has used every device of furring, paneling, concealing, short-changing and bluffing to get over this difficulty. In most cases he has succeeded, but every once in a while you will find a room that has the appearance in plan of a *sole meuniere* or *tripe a la mode de Caen.* Nearly all the bathrooms are shaped like a piece of mince pie, but that is no trouble to anybody but the tile setter. They (the bathrooms, not the setters) are much larger than ours, and all contain a fourth fixture commonly known as The Old Family B—t.* This useful and sightly object is never used in American architecture, but our sisters across the ocean simply couldn't do without it. And let me whisper this in confidence, I think they're right.

Now as to further evidences of M. Jean Walter's ability. On December 21, 1928, the municipality instituted three more competitions for the three remaining plots. M. Walter won two of them, M. Azema being awarded the third. M. Walter's two new buildings will cover about 500,000 square feet, something colossal, and for the second of these new plans M. Walter has evolved something he considers much superior to his first design. In it he has eliminated a great deal of the service across bedroom corridors, and instead of having a *grand salon* and a *petit salon* he has designed one large space 70 x 26 which can be subdivided or not, to suit the whim of the tenant or the buyer.

In conclusion, I aver, most honestly, that we should give an apartmental decoration to M. Walter for this group of fine edifices. But there are others as well, especially a magnificent apartment building, half completed, designed by M. Arfvidson, an architect well known to many of us here in the States. He has included one apartment which recently sold for $200,000, quite the record for Paris. But this particular apartment has two stories in front and three in the rear, practically a *hotel particulier* but with none of its inconveniences.

It is said that in certain parts of Paris one can buy an apartment for what one would pay in rent here in New York. I know, however, that Paris property on an average runs about 10 per cent of the cost of similarly located property in New York, and that a building like that designed by M. Walter and ignobly described here, runs about 48 cents a cubic foot cost of construction. We architects in the United States have a habit of looking down on the rest of the world from time to time, but these new apartments in Paris are nothing to be caviled at. No, not at all. They are superb. They are the last word. They have It. They have everything they should have,—but I can't help thinking about those closets out in the hall!

*Extract from *Le Matin* of March 4, 1930: *"Mais hier, a la police judiciaire, il sortit un carnet que M. Faux-Pas-Bidet examina."*

BOOK DEPARTMENT

WIND BRACING FOR TALL BUILDINGS

A REVIEW BY
ARTHUR T. NORTH

WITH the 80-story building here and the 100-story building in plain sight, the subject of wind bracing these high tower structures demands the best methods of designing. The stability of existing and of future towers is not questioned, because they have been designed to provide adequate strength. With these greater heights the rigidity and prevention of disturbing movement during wind storms and greater economy of construction must be accomplished satisfactorily. The rentable value of floor space can be adversely affected by the fears of tenants caused by storms, even though the structure is entirely safe. It is an economic problem pertaining to rental value and cost of construction.

The subject of wind bracing has been befogged and befuddled by a confusion of ideas and too much mathematics. Young engineers are entitled to expect clear thinking and candid opinions from their elders to guide and instruct. "Stock in trade" should not exist in a profession where all have been beneficiaries of the past. Lengthy mathematical discussions are no substitute for sound theory, nor as much to be desired as clarity of thought and expression. To clarify the subject of wind bracing, Mr. Spurr presents an exposition of his yardstick for a rational method of designing. It differs from the generally published and used methods in several respects. The yardstick is given in the suggestions for building codes:

1. "All buildings where the height ratio equals or exceeds 7:1 shall be investigated, and shall meet the requirements as to strength and stability to resist in the structural frame an assumed wind load of 30 pounds per square foot at the top, diminishing uniformly to nothing at grade. This triangle of loading is to be assumed on the entire area of the structure with the wind blowing in any direction. No reduction in the 30-pound wind load shall be made in coming down from the top until a point is reached which is below all spires, peaked roofs or other extensions of the main shaft of the building.

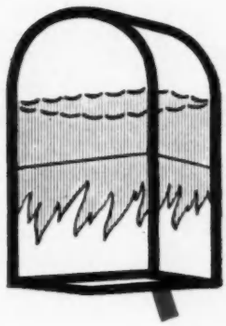
2. "In applying the assumed wind load defined here on the structural frame, the designing engineer shall thoroughly investigate the rigidity of the structures. In all cases the rigidity of the frame shall be such that under this assumed wind load the total deflection at the top of the building shall not be greater than two-thousandths of the height. ($0.002h$) the height being the distance from the base of the building to the highest framed level accessible to the public or the general occupancy of the building. In the analysis of the frame for rigidity, full consideration is to be given to all elements which will cause deflection, such as distortion in beams and columns due to bending under wind stress, distortion in connections, and the deformation in the columns under axial wind loads. The stresses in the various parts of the structure under assumed wind load only shall be such as to meet the requirement of rigidity as stated here. The maximum allowable stresses under wind alone, or under combined live, dead and wind loads, shall not exceed 24,000 pounds per square inch. Beams thoroughly encased in stone-concrete haunches with a minimum of 2 inches of concrete, may be considered to have stiffness increased a maximum of 25 per cent."

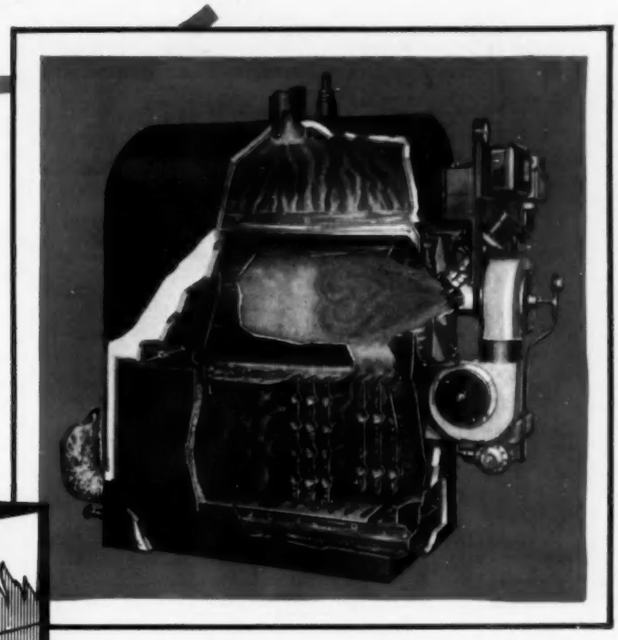
It is noted that an allowable deflection of the frame is provided for which is not detrimental to the occupancy of the structure. The nature of vibration and the problem of "elastic behavior" are explained in relation to wind forces and divided into two phases:

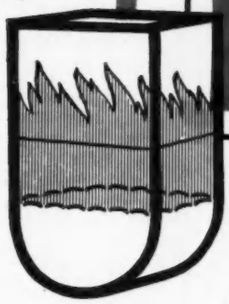
"The first phase which may be considered is the effect of the working of the structural frame on the enclosing masonry and interior partitions. If the frame is too flexible the working of the building may cause damage to the outside masonry by partial disintegration, and produce cracks in the interior partitions. These effects will be proportional, generally speaking, to the amplitude of vibrations.

"The second phase of the problem concerns the effect of vibration on the tenants. There is, no doubt, a combination of amplitude and frequency which becomes unpleasant and may become disturbing. Speaking strictly in a mechanical sense, acceleration should be the important factor, but the author believes that amplitude of vibration is equally important in its effect on the human nervous system. It may be that the 'factor of disturbance' to tenants will vary as amplitude times frequency. Relatively large accelerations on very small amplitude will pass unnoticed, no doubt, and relatively large amplitude would cause little concern if produced very gradually. Experiments will do much to clear this up."

In tall towers, Mr. Spurr favors the use of knee braces and framed panels which effect a reduction in tonnage of about 5 per cent in the frames using only shallow connections. This is a considerable item in the cost of construction. By intelligent planning and coöperation between the architect and engineer, knee braces and framed panels are used satisfactorily. "As a matter of fact, there is nothing particularly pleasing in a straight beam haunch from column to column. Architectural insistence on this condition is silly in a modern high tower, as would be instantly admitted in the nave of a Gothic cathedral. In the latter case the architect has the classic precedent, based on sound construction conceived by artist artisans which has endured, to guide him. Likewise, knee braces in a high tower are particularly fitting







THEY TURNED THE BOILER UPSIDE DOWN

When Garfield A. Wood, famous engineer, business man, and speed boat king, installed an oil burner in his home, he liked its automatic heat but his engineering experience told him it was too costly. He discussed this problem with that prominent engineer and inventor, the late H. M. Jerome, who later interested Prof. W. E. Lay of the Automotive Engineering School at the University of Michigan.

These two scientists studied boilers . . . and found them surprisingly inefficient. The old-type boiler was built for coal firing. Its short, wide flues were not designed to absorb the intense heat generated by oil or gas burners. Consequently stack temperatures were high. Instead of being held in the heating plant the heat was being lost up the chimney.

Boilers had been built that way for many years. That's where the trouble lay . . . they weren't designed for oil and gas burners. So the two engineers did an unheard of thing. They LITERALLY turned boiler design UPSIDE DOWN. The combustion chamber, where the hottest gases are, is located at the TOP of the boiler, toward which the hottest water naturally moves. Only this smallest portion of the water circulates and it alone absorbs over half the radiant HEAT of the fuel. The cooling gases pass downward . . . against the cooler water in the system . . . through flue passages, formed by large, flat water tubes, to the outlet flue located at the very bottom of the boiler. Baffles on the tubes cause a scrubbing action of the gases against the metal, effecting almost perfect heat transfer.

But progress did not stop with the completion of a boiler which delivers a previously unheard-of heating efficiency. A burner equally revolutionary was designed, and the two engineered into the Gar-Wood Balanced Heating Unit. All the interesting details are told in a new book. You'll want a copy . . . so use the coupon, please.

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as true construction, and pleasing to a trained eye. The day may not be so far away when moderate knee braces may be a favorable item for general advertisement of space by owners in our lofty towers. This seemingly distant day may be materially hastened by rigid architectural insistence against their use in a few lofty structures of critical proportions. In any event, the proper use of deep frames will show material savings in tonnage and field riveting, where equal rigidity is considered in the design. The erection costs of a high tower will reflect a saving of from $2 to $3 per ton, in the author's opinion, with a considerable saving in time.

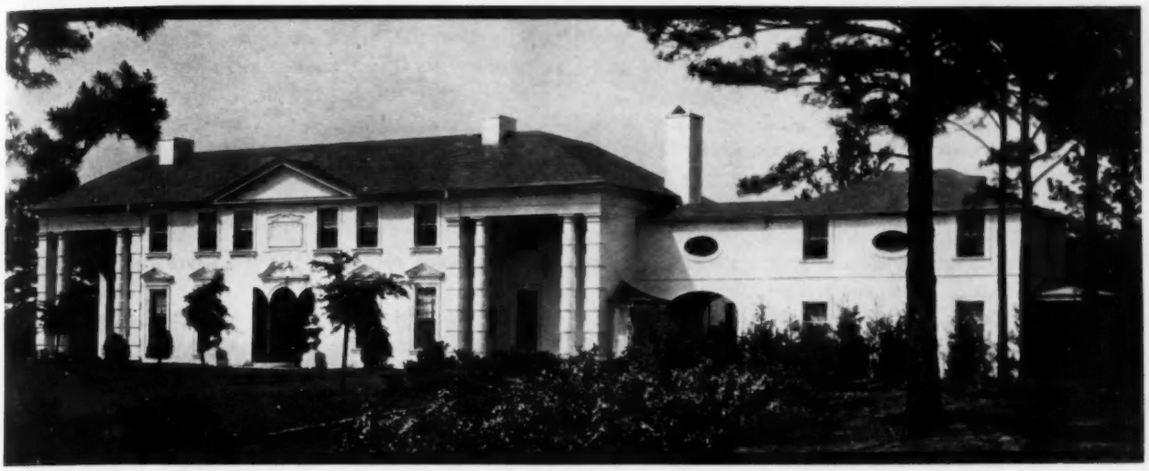
Mr. Spurr does well to warn architects that the high tower is a specific architectural problem unlike others heretofore known. The insistence of carrying established low-building architectural design practice into high-tower architectural practice may result in a disaster to the investment. This will also be a disaster to the architect who places a "pleasing architectural effect" before sound engineering practice. Architecture must adjust itself, along with structural engineering, to the problems of the high tower. Mr. Spurr has given without reserve and unselfishly from his "stock in trade" acquired by a long and successful experience in designing high towers, some of them equal in height to any yet constructed. His proposed yardstick is worthy of the most careful study and unbiased consideration. It will be provocative of discussion and undoubtedly will be eventually accepted because of the reasonableness of its basic assumptions. He has made a distinct contribution to the literature of wind bracing, doing much to clarify the interminable mathematical hair splitting which is unusable and ineffective for the practicing structural engineers. Structural engineers, architects and builders, —and also the investor of funds in high towers,—can well afford to consider this book. There is much at stake, and we should all proceed with open eyes and minds.

WIND BRACING; THE IMPORTANCE OF RIGIDITY IN HIGH TOWERS. By Henry V. Spurr. 132 pages, 6 x 9, diagrams and graphs, cloth. Price $3. McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York.

MR. HOLDEN in his introductory text notes the variance between the progress that has been made in domestic architecture and the so-called skyscraper architecture, and he attributes it to the influence of our home traditions, surroundings and habits of life. He sees the appropriateness of our country houses as parts of the surrounding landscape and the incongruity of the modern elemental and embryonic foreign forms of dwelling houses in such surroundings. He finds that we are drawing away from a superficial "period" conception of domestic architecture and are drawing upon tradition only for the best that it can furnish us to interpret function, use and setting. It is encouraging that Mr. Holden finds that where formerly only very large houses were given the attention of the best architects, now the medium and even the small sized houses are beginning to receive the consideration that they merit. He also finds a growing understanding of the subtle relationship between "beauty" and "efficient use."

The illustrations, with floor plans, are drawn from all parts of the country and indicate the influence of climatic

★



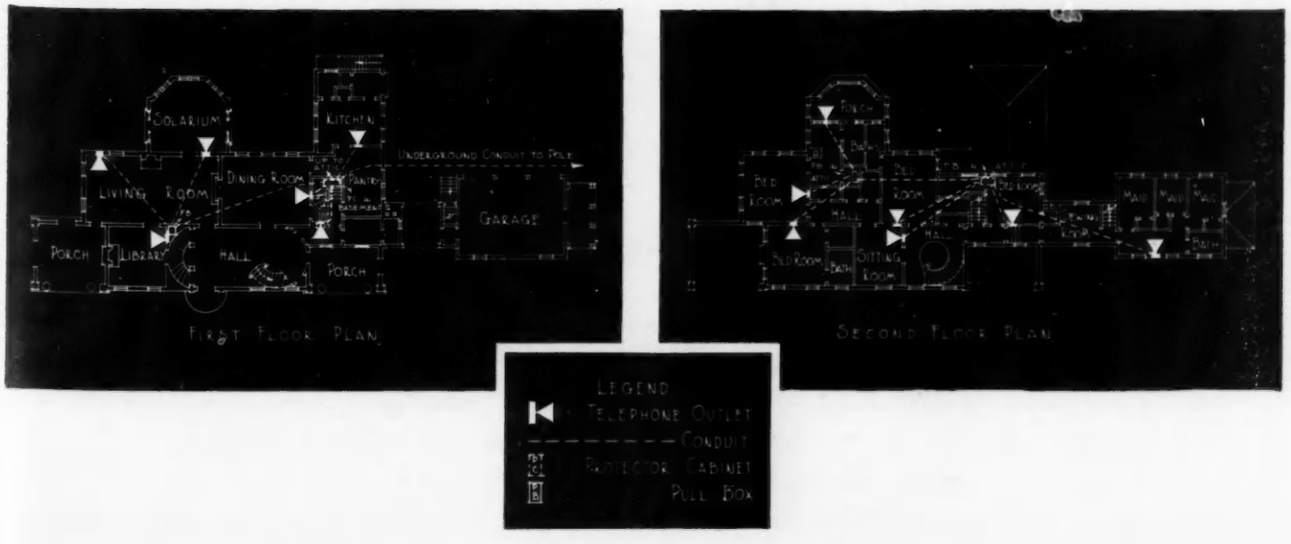
Thirteen telephone outlets, including one in the servants' quarters over the garage, provide for complete telephone convenience in the home of Dr. LeRoy Childs, Tuxedo Road, Atlanta, Georgia. Conduit for the telephone wiring is built into the walls and floors. HENTZ, ADLER & SCHUTZ, *Architects, Atlanta.*

A mark of a well-planned home

AMONG the important features of a home which contribute to the ease and comfort of the occupants is *telephone convenience* . . . that modern note which should be considered in the early stages of planning for a new home or remodeling an old one.

Planning in advance the provision for telephone convenience in a house makes possible the placing of conduit within the walls and floors during construction. This improves the interior appearance by concealing the telephone wiring; insures against certain kinds of interruptions in the telephone service; and provides for complete convenience by making telephone outlets available in all the important rooms. The occupants can use whichever outlets they wish, and can easily expand or rearrange the telephone service to meet their changing needs.

Your local Bell Company will gladly help you plan the telephone arrangements for new and remodeled residences. There is no charge. Just call the Business Office.



conditions, and through it all there are discernible certain qualities which are fundamental. With the great variety of plans and designs illustrated there is always found appropriateness of a uniformly high quality. We have no need to be ashamed of our country houses but rather can rejoice in the freedom of their design, the quality of materials used, and the evidence of skilled workmanship. The country house of today is relieved from the restrictions that seem to inhere in the "grand house" which is modeled on the original conception of a palace. In these less pretentious houses the units are disposed for convenience and are still harmonious in composition. The reader will enjoy the excellent quality of the illustrations and the makeup of this book, and after repeated inspections and study must come to a realization of the versatility, good taste and refinement of the architects whose works are included. It is a fine exposition of representative American country houses.

AMERICAN COUNTRY HOUSES OF TODAY. Compiled by R. W. Sexton with Text by Arthur C. Holden. 203 pages, illustrations, 9½ x 12½, cloth. Price $12.50. Architectural Book Publishing Company, 108 West 46th Street, New York.

PROFESSOR JAGGARD was not only a well known English architect but also a lecturer on construction at the University of London. He was a sincere admirer of brickwork in a country where brickwork attained a high state of perfection. He vizualized using brickwork as a craft, not merely as a trade, embodying artistic handling and sympathetic grouping and finishing, in addition to the conception of stability and durability. Aside from the element of color, the appearance of an unbroken brick wall depends upon the arrangement and bonding of the brick and the character of the mortar joints. With the proper color of bricks a plain wall can be made very interesting as a colored and textural surface. The introduction of arches and projections makes brickwork the most flexible and variable construction. The art of brick construction has been developed in manners characteristic to many countries and, with due regard to the fine brickwork of certain sections of Germany and Holland, the brickwork of England is not surpassed in its appropriateness and beauty.

There is a new interest in brickwork in America, and particularly in New York, and architects are giving great attention to its possibilities, especially in its more finished uses. Granting the picturesqueness of a certain uniformity of color and placing affected in smaller structures such as dwellings, the great sizes of our brick skyscrapers demand a treatment that does not detract from the dignity of mere bulk. In this respect the English methods of bricklaying are more adaptable to our large building needs than those of the continent. For that reason, this volume should appeal particularly to those American architects who are interested in this type of construction; but it should not be assumed that the English methods are not equally appropriate for American dwellings.

BRICKWORK AND ITS CONSTRUCTION. By Walter R. Jaggard. 317 pages, 5½ x 8½ inches, illustrated, cloth. Price $6. Oxford University Press, 114 Fifth Avenue, New York.

THE ARCHITECTURAL FORUM

VOL. LIII, NO. 3 SEPTEMBER, 1930

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THE DERRICK

PHOTO BY VAN ANDA

THE
ARCHITECTURAL
FORUM

VOLUME LIII NUMBER THREE

SEPTEMBER 1930

CONSTRUCTION AND MAINTENANCE

BY
EUGENE H. KLABER

A GROWING interest in housing problems has found its echo in numerous articles in the architectural press, illustrating housing projects, both those consisting of individual dwellings and those in urban centers having multi-family houses. They illustrate well the general principles of group planning, layout of units, and exterior design, but there are a host of problems encountered in the actual execution of a housing project which they do not touch and which vitally affect the economy of construction and subsequent maintenance. These notes may, therefore, prove of interest to those working in the field of housing. They are the result of experience with a large housing project recently carried out in Chicago,* covering a block 362 feet by 594 feet and comprising 421 apartments. They touch phases of both planning and specifications, and are presented as itemized problems without any attempt to form a coherent story. Where possible, there are given the pros and cons of methods adopted, and the materials used are named.

FIREPROOF CONSTRUCTION. The Chicago building code requires fireproof construction for apartment buildings more than three stories in height. As this project consists of five-story buildings, it is completely fireproof. Had it been erected in New York it could have been built at a saving of ten cents per cubic foot. This cost translated into rental would mean a saving of about $7.50 per month for a four-room apartment, with rooms of the average size used in Michigan Boulevard Gardens. This saving is predicated on the supposition that the same layout, with rooms of similar size, can be obtained in an equal area in both ordinary and fireproof construction. As a matter of fact, however, non-fireproof construction requires a greater area for a given layout, and this tends to reduce the difference in cost and rental.

Some of the compensating advantages of fireproof construction are these. In ordinary construction, 12-inch walls would have been required around the stair halls; with plaster on one side the total thickness would be 13 inches. The partitions used finished 4½ inches thick. To have the adjacent rooms of similar sizes, the former type of construction would require an additional 17 inches in length of outside wall for each staircase. With 29 stair halls, 41 feet were saved. Translated into cubage this represents nearly 40,000 cubic feet. Where the plan requires offsets in the stair hall with long landings at the floor levels, the advantage of fireproof construction is obvious. Partitions surrounding the floor landing are readily placed on a continuous fireproof slab and if necessary can be varied from floor to floor. Nor is the same degree of accuracy required in locating doors to apartments, as the hall partitions may be installed after the interior partitions are set.

With a completely fireproof construction, metal, self-closing doors to all apartments, the stairs carried from ground to roof and a continuous roof permitting exit from one stair-head to any other, the customary requirement of a second stair exit from every apartment was waived. In Chicago this second stair is usually an outside wooden structure reached from the kitchen. In addition to the saving in cost, its omission permitted a much greater flexibility in planning. Kitchens could be placed anywhere, front or back, without marring the appearance of the building.

In ordinary construction cross fire walls are necessary at intervals. If they run straight across the building they hamper flexibility in planning. It is frequently advisable to interlock rooms of apartments in the length of a wing, causing an offset in the division between two adjacent units. With a masonry wall this is expensive, with fireproof partitions it is comparatively inexpensive. Again the thickness of the wall makes a differ-

* Michigan Boulevard Gardens, Eugene H. Klaber and Ernest A. Grunsfeld, Jr., Architects; Henry Wright and Associates, Consultants.

ence in the aggregate cubage of the buildings.

Under favorable conditions some saving may be made in fireproof construction in the finished thickness of the floor construction. If we leave out of consideration the greater resistance to spread of fire and vermin, and the elimination of wood shrinkage, there is still much to be said for the use of fireproof construction, even where local ordinances do not demand it.

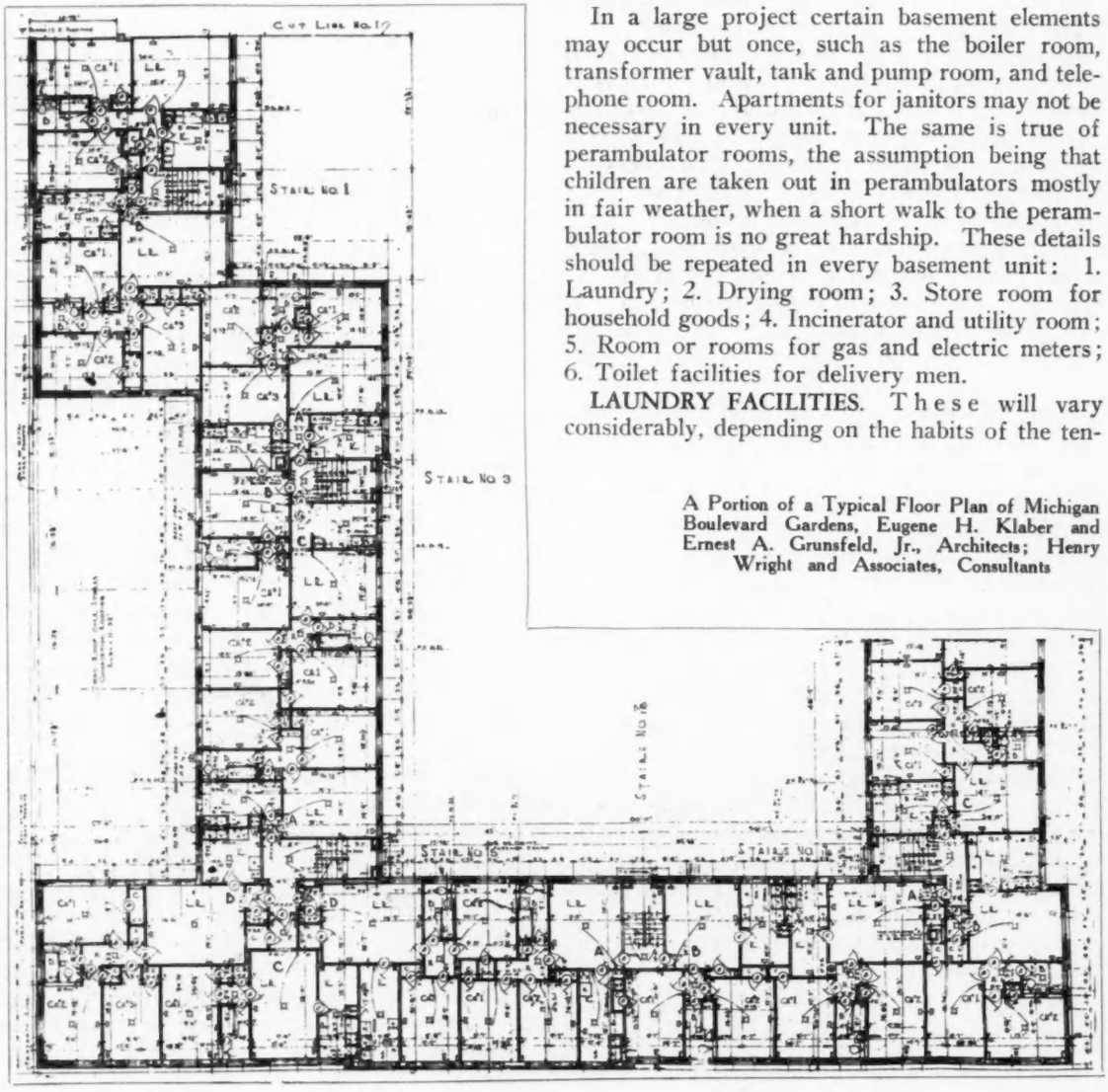
THE BASEMENT. This floor is the servant of the upper stories, and as is frequently the case with servants, its life is warped to conform with the requirements of the family upstairs. An economical layout is very difficult to obtain. Columns, plumbing pipes, staircases and dumbwaiter shafts are laid out for the best convenience of the upper floors, and the servant downstairs must accept them and make the best of them. Access to stairs and dumbwaiters is essential and usually cuts up the plan into comparatively narrow units.

In a small building with one staircase and one or two dumbwaiters, the solution of the basement plan is more or less indicated; where the basement is continuous and reached by a series of stairs, the problem is more complex. Certain principles may, however, be observed.

The basement unit should be as large as possible without causing too long a walk to any of its functions. If incinerators are charged in the basement, one stack can serve many apartments as well as a few. Only one toilet for delivery men is necessary for each unit, and one delivery entrance, again pointing to the advantage of the large unit. Laundry, drying room and store rooms arrange to better advantage and do not require the same percentage of surplus allowance. As far as possible, a given service should be concentrated in one area.

In a large project certain basement elements may occur but once, such as the boiler room, transformer vault, tank and pump room, and telephone room. Apartments for janitors may not be necessary in every unit. The same is true of perambulator rooms, the assumption being that children are taken out in perambulators mostly in fair weather, when a short walk to the perambulator room is no great hardship. These details should be repeated in every basement unit: 1. Laundry; 2. Drying room; 3. Store room for household goods; 4. Incinerator and utility room; 5. Room or rooms for gas and electric meters; 6. Toilet facilities for delivery men.

LAUNDRY FACILITIES. These will vary considerably, depending on the habits of the ten-



A Portion of a Typical Floor Plan of Michigan Boulevard Gardens, Eugene H. Klaber and Ernest A. Grunsfeld, Jr., Architects; Henry Wright and Associates, Consultants

ants. In this case the tenants are colored, and as a large proportion of colored women do their own washing, ample provision had to be made. Each unit laundry contains one pair of wash tubs, one three-burner gas plate, and one section of gas dryer for every 7½ families served. As some of the tenants prefer air drying to gas, a separate room is provided for this purpose as well as a small room for storing privately-owned washing machines. A line is run from each private gas meter to a manifold in the laundry. When the gas is turned on it flows to a given gas drier and gas plate. Thus the tenant uses her own gas supply. The supply cock can be locked shut with a padlock on the handle, preventing use by others, and when the gas is on, the lock can be transferred to the dryer, so that a woman can leave her clothes drying without danger of theft. In actual practice it has been found that very few of the tenants own washing machines, and it is questionable whether a storage room is essential.

STORE ROOMS. Individual store rooms were considered, but abandoned in favor of the common room. If a tenant has a separate room, of which he only has the key, there can be little question of the owner's responsibility in case of loss; there is also less danger of the spread of vermin. On the other hand, the cost of installation is considerable, and the space consumed is greater than for common rooms. Most families of small means have little surplus furniture, and half of the rooms would be empty. These considerations prompted the scheme adopted. The janitor is the custodian of the key, and no one enters except in his company. Goods removed are receipted for. An allowance of 30 square feet of area per family was made and seems to be ample.

INCINERATORS. Disposal of garbage presented a serious problem. There are two usual methods. In one, the incinerator has an opening on each floor and the tenant empties the garbage into the hopper on his floor. This has the advantage of eliminating service, and of giving quick removal of waste from the kitchens. Its drawbacks are several. There must be an incinerator stack for every staircase; the space consumed is considerable; and if there are only two apartments per floor, the cost per family is excessive; the odor of garbage is likely to pervade the stair hall, as hoppers are sometimes left open and tenants occasionally are careless in dumping their pails. The second scheme was preferred in this case. Garbage is kept in a ventilated container built in the outside wall, until collections are made. The can is then placed in a special metal container under the dumbwaiter car and sent down. The attendant in the basement travels from one dumbwaiter to another, wheeling a truck. As the collections are made he replaces the full can on the dumbwaiter with a clean empty can. When full, the truck is wheeled to the utility room, where the contents of the cans are thrown into the incinerator and the cans scoured at a sink. This system necessitates dumbwaiters and periodic service furnished by

National Photo

Garden Court, Michigan Boulevard Gardens

National Photo

Simplicity and Consequent Economy are Shown in Michigan Boulevard Apartments

the landlord. On the other hand it is cleaner. It requires fewer incinerators. As many as 55 families are served by a single stack in Michigan Boulevard Gardens. As no access is required above the basement, the incinerator stacks may be located in the "blind corners" of the plan, wherever space is available.

METER ROOMS for gas and electricity are essential. Whether to have one room for each basement unit, or one at or near each staircase is a moot question. The former arrangement lengthens the average branch service line up to the apartment, the latter lengthens the average run to the manifold in the laundry.

Toilet facilities for delivery men are essential in cities where public comfort stations are infrequent. They prevent considerable nuisance. It is also well to have a toilet in connection with the laundries in large units where women work for a considerable time at a distance from their apartments.

STAIR HALL PARTITIONS. The walls of stair halls are always a problem, the more so in a building in which all furniture must be carried up and down the main stairs. To avoid the constant cost of cleaning fingermarks and repairing the chipping of plaster caused by moving furniture, a material had to be found which is readily cleanable and which withstands abrasion. Brick walls would have required 8 inches of thickness, and unless glazed they are hard to keep clean.

The material adopted was a salt glazed vitrified tile block, with rounded corners and having the back scored to receive the plaster. The advantages of this material are its thinness, pleasant color, and glaze. The halls are cheerful and the light carries well to the rear. The difficulties likely to be encountered are these: The block is produced in a kiln, and the color varies with its position in the kiln. Uniform color on a block and avoidance of flashed colors are difficult to obtain, and to get them means vigilant inspection and rigid insistence that the material man furnish what is wanted. The material is difficult to cut, and no pipes can be run in the partitions. Shelf angles must be bolted to the concrete to carry the surface continuously past the floor levels. If delivery is not made promptly, plastering will be delayed in the rooms adjacent to the stair hall.

FLOORING. Two principles should be observed in determining the finished floor material in a fireproof building: (1) Avoid excessive thickness between the rough slab and the finished floor. (2) The thickness should be uniform in all cases so that the slab may be poured at a single level throughout.

With sleepers underneath the wood floors a thickness of 2½ inches is required between the rough and the finish. About the same dimension is necessary where tile floors are installed in bath-

rooms and terrazzo in hallways. The adoption of materials in all three locations which would finish ¾-inch thick above the rough slab saved 1¾-inch per floor, or 8¾ inches in the total height of the building; multiplied by an area of about 70,000 square feet resulted in the saving of approximately 50,000 cubic feet.

The materials used were these: In the stair halls, stair treads and bathrooms, a composition consisting of magnesite with marble chips as a wearing surface, which when ground is ¾-inch thick. In rooms, closets, apartment foyers and halls, a wood floor was laid, of oak in squares made up of pieces 2¼ inches by 9¾ inches, or 13 inches. Adjoining squares had the boards running in opposite directions, thus making a basket-weave pattern. This flooring is attached to the floor by dipping the bottom surface of the boards in asphalt.

Some difficulties have been encountered. Wood floors must be carefully dipped so that the asphalt does not get above the tongue, otherwise a liquid filler will bring the asphalt to the surface in the cracks. When these floors expand, due to moisture, the expansion can be taken care of by leaving an open margin under the shoe mould. This expansion occurs evenly over the whole floor. When the boards contract there is no general pulling back, but the contraction is likely to show as an open crack at any point. When the flooring is brought into a building that is still damp there is a certain swelling across the grain. This means that the resultant panels are not exactly square, and gives rise to irregularities at the meeting of the squares. Unless great care is exercised in laying, this may result in open holes between the squares, sometimes as large as a lead pencil.

Magnesite terrazzo should not be used with a dark background. There is salt in the composition which shows as a white efflorescence on any dark background. By repeated washing the salt may be removed, but it greatly mars the appearance while it persists.

PLUMBING FIXTURES. In speculative projects intended for quick sale it is customary to skimp the quality of the concealed work and have the trimmings showy but unsubstantial. Large housing projects are seldom sold; the owner must therefore consider the question of upkeep very carefully. Brass goods must be of the best quality with as few movable parts as feasible. Faucet seats should be readily removable. Handles and escutcheons should be metal, not china. The latter need constant replacement. For tubs with showers above it is advisable to use a combination fitting with one cold water valve, one hot, and a diverting valve to direct the united stream either into the tub or to the shower. This means three moving parts instead of the customary five. Mixing valves are expensive and may frequently get out of order. Any form of standing waste on bath tubs is a source of trouble and most of them require an access panel. A heavy rubber plug with a strong chain is about as satisfactory as anything. In the worst case, if lost they are readily replaced.

To avoid the cost of individual shut-offs for each fixture, a pair of valves may be installed controlling the water of each apartment. This permits making repairs on a given floor without losing the use of other bathrooms and kitchens on the same stack. Good toilet seats are a sound investment. Exposed metal parts are subject to verdigris. This can be avoided by having all brass work covered with vulcanized rubber. In kitchens a combination sink and wash tray with movable drain board and swing spout faucet is advisable. It permits light laundering of perishable fabrics in the apartment and relieves the demand for use of the cellar laundry.

ELECTRIC METERING. In a large project it is possible to make the purchase and sale of electric current a source of income by having a master meter, buying the current at wholesale rates and charging the tenant the retail rate. If this is done the landlord must buy and install the apartment meters, he must read them, send bills, and collect the money. In addition to the cost of these services, there are likely to be bad debts and disputes with tenants over the correctness of the reading. If the tenant has contracted with the power company and does not pay his bill, his supply is shut off, but there is not the same bad feeling as if the landlord were to do the same thing, under the same circumstances.

It is hoped that these paragraphs may prove of value to those of the profession who are engaged in the arduous struggle with the housing problem, and that they will prompt others to add their contributions setting forth their experience.

FINANCING COÖPERATIVE APARTMENTS

BY

LOUIS G. KIBBE*

THE financing of coöperative apartment buildings calls for the utmost in conservatism, for whereas in the case of a rental operation the builder is the only one who suffers loss in the event of failure, in the case of a coöperative apartment project any loss through foreclosure might fall upon the tenant owners. Fortunately the promoters of these projects in New York City have exercised commendable judgment in their financing, and as far as I know, no tenant owner of an apartment in Manhattan has ever suffered a loss from this source.

Broadly speaking, there are three acceptable methods of financing apartment buildings of the rental and coöperative types:

1. By what are known as institutional loans—that is to say, loans made by such institutions as life insurance companies, title companies and savings banks, the amount of the loan ranging from 50 to 65 per cent of the appraised value of land and building.
2. By means of a bond issue, usually in an amount representing approximately 75 per cent of the value of land and building.
3. By either a bond issue or an institutional loan, supplemented by a second mortgage, this method being used extensively in financing rental and semi-coöperative buildings.

In some of the western cities, notably Chicago, where there is not free access to institutional funds such as those described in plan 1, the promoters have been forced to utilize the bond issue method. However, in New York City this method is seldom used, practically all of the cooperative apartment projects having been financed by institutional loans.

Taking the three plans in the sequence just named, the advantages and disadvantages may be stated somewhat as follows:

1. *Advantages.* The initial cost of financing is much less than under any other plan, averaging 2½ to 3½ per cent of the amount of the loan. The interest rate is also the lowest available in the market, being as low as 5 per cent in normal times and seldom exceeding 5½ per cent. Because of the fact that in a coöperative project these loans are usually less than 50 per cent of the sales value of land and building, and of the care usually exercised by the promoters in the selection of the site, the annual amortization is considerably less than in any other type of financing. These savings contribute notably to the success of the project, being reflected,

1st, in the sales price of the apartments, and

2nd, in the annual charge for maintenance, frequently referred to as proprietary rent.

These institutional loans have an average maturity of about five years. Where amortization is not demanded by the lending institution, provision should be made for the creation of a sinking fund for the purpose of paying off part of the mortgage at its maturity, thereby insuring refinancing at a minimum cost.

The difference between the amount of the mortgage and the sales price of land and building is referred to as "equity" and in the case of cooperative apartments must be supplied by the purchasers of the respective apartments, with due consideration to the size, location, etc., of the apartment units. Obviously, the purchasers are called upon to pay more in cash for their apartments where the initial financing is in the form of an institutional loan than would be the case when a bond issue is involved. This condition represents about the only objection that can be given to the use of institutional loans and is more specious than real; moreover, the objection can be overcome completely by providing for term payments by the individual purchasers of the apartments, thereby insuring sound financing of the building and at the same time affording a convenient means for financing the equity payments.

Plan 2. The only appeal that this plan offers is in the reduction of the equity cash to be supplied by the individual purchasers, but the attendant disadvantages are so pronounced that this means of financing is seldom resorted to where institutional funds are available. The initial cost of a bond issue averages 8 to 10 per cent of the amount of the loan—the interest rate averages 6 per cent —sometimes even 6½ per cent being charged—while the annual amortization runs around 2 per cent to 3 per cent. These factors are reflected in the initial cost of the apartments and in the annual maintenance charges.

Plan 3 combines a first and second mortgage in the financing and should never be used in connection with coöperative apartment projects unless the second mortgage runs for a sufficient term of years to permit complete liquidation at maturity. A short term second mortgage in a considerable sum, maturing before liquidation can be accomplished, is a distinct hazard and may cause serious embarrassment through the necessity of refinancing at maturity.

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A CHECK LIST OF FEATURES THAT MAKE APARTMENTS POPULAR

BY

J. O. DAHL

THE quickest and most certain way to bring back to normal the building of apartments and apartment hotels is to design structures to meet the price ranges and comfort specifications of people who now live in one- and two-family houses and obsolete multi-family dwellings," said a builder whose developments are meeting with success.

"People often speak with sarcasm of homes which, in their estimation, are built to sell," he continued. "Personally, I make an obvious attempt to have every one of my structures built to sell. This doesn't mean that I don't put honest materials and workmanship into my buildings. But it does mean that I consider the factors of style, color and luxury to the same degree as do the mechanical and sales engineers.

"The average motorist buys a new car every year or two. The average apartment dweller, especially in the larger cities, moves as frequently. But my problem is greater than that of the motor manufacturer, because I can't get high enough rentals to justify scrapping my investment when my original tenants move out. What I have done is to look ahead at least five years and include the most modern features, and at the same time plan for enough flexibility to add later improvements as they come along. With the addition of such sales features and by maintaining my buildings in good condition, I am able to keep some of my tenants longer than usual, and to get new ones without a great deal of difficulty."

Women invariably cast the deciding vote in the selection of a home is the report from every rental agent. The man of the house is satisfied if his new home is convenient to the office and golf links and has adequate garage accommodations. He is finicky about a shower, good shaving mirror and light, a large tub, large drain pipe and ample storage space in the bathroom. Generally, he wants a quiet place that is warm in winter and cool in summer. Creature comforts are more important than beauty. But the modern woman, and she grows more modern each year, demands the last word in construction and equipment.

The list included here is as complete as space permits. It is based on the experience of realtors, builders and apartment dwellers in several states. The data have been checked against mail questionnaires and the writer's personal experience as the operator of hotels and a resident in apartments the past 12 years. It has been impossible to make allowances for certain sectional requirements due to climatic and other local conditions

PLAN FEATURES

- Light, airy courts
- Adequate entrance lobby
- Rooms proportioned to class of apartment
- Rooms sized to take usual furniture
- Cross ventilation
- Minimum private halls
- Convenient communication between rooms
- Exposure of most used rooms
- Convenient door swings
- Unbroken wall spaces
- Large closets
- Adequate number of closets

CONSTRUCTION FEATURES

- Soundproof construction
- Fireproof construction
- Friction door hinges
- Servidors
- Ventilator doors
- Roll screens
- Rubbish chutes
- Safety locks above knobs
- Weather strips
- Large windows

PHYSICAL SURROUNDINGS

- Landscaped grounds
- Parking space
- Miniature golf course
- Putting greens
- Swimming pool
- Garden seats
- Playground, roof, safety features
- Flower gardens
- Fountains
- Tennis courts
- Wading pool
- Garden parasols
- Roof garden (seldom profitable as apartment house restaurant)
- Colorful awnings
- Chauffeur signals
- Porte cochere
- Mail boxes
- Window flower boxes

MECHANICAL FEATURES

- Concealed radiation
- Central cleaning system
- Incinerator

MECHANICAL FEATURES, *Cont'd*

Silent mechanical refrigeration
Self-leveling elevators
Safety features on elevators
Circulating ice water
Water softener
Rustless hot water lines
Filtered drinking water
Ventilated kitchens
Ventilated corridors
Automatic door checks
Temperature control
Noiseless, sootless heating
Radio outlets
Easily opened windows
Surplus hot water

KITCHEN FEATURES

High grade range, gas or electric
Step-saving kitchens
Colorful walls and trim
Colorful floor
Floor of cork, linoleum or rubber
Automatic dishwasher
Stainless sinks
Mixing faucets
Laundry tub in kitchen
Built-in ironing board
Built-in table
Built-in can opener
Built-in bottle opener
Broom closet
Numerous electric outlets
Modern kitchen cabinet
Dumbwaiter

BATHROOM FEATURES

Color in tile and fixtures
Safety shower mixer
Heated baths (all year)
Glass enclosed shower
Enclosed tub bath
Enclosed toilet
Chair over toilet seat
Tub and shower combination
Colorful shower curtain
Silently flushed toilets
Floor material
Mixing faucets
Built-in bathroom scales
Dental lavatory
Double medicine cabinets
De luxe mirrors
Built-in bottle opener
Hot water bag hooks
Clothes hooks
Convenient towel racks
Recessed tissue holder
Large tubs
Large drain in bath
Special shaving lights

BATHROOM FEATURES, *Cont'd*

Built-in drawer space
Several electric outlets
Ventilated baths
Chromium plated fixtures

ROOM EQUIPMENT

Electric clocks
Casement or double-hung windows
Numerous base plugs
Radiator enclosures
Luminous door numerals
Parquet floors
Floors of cork, linoleum, rubber
Drapery hardware
Wall safe
Full-length mirrors
Phone connection in each room
Wood-burning fireplace
Fireplace, gas log
Modern wall finishes
Quality window shades
Unbroken wall areas
Arched doors
Built-in book cases
Modern facilities for hanging pictures
Decorative lighting fixtures
Luminous electric switches

CLOSET EQUIPMENT

Cedar closet
Built-in drawers
Shoe racks
Hat stands
Built-in hangers
Tie racks
Cellarette closets
Lighted closets
Carpeted large closets
Adjustable shelves
Special door locks

SPECIAL FEATURES

Well equipped house laundry
Modern clothes drier in laundry
Dry storage for trunks
Baby carriage hall
Ballroom or meeting room
Food shop
Valet shop
Maids' rooms
Provision for pets
Garage
Solarium
Ample fire protection
Public dining room
Safety deposit boxes
Delivery door in kitchen
Telephone wall cabinets
Mail chutes
Centralized radio
Awnings

SOUND INSULATION IN APARTMENTS

BY

ROGER W. SHERMAN

THE fact that noise has become a problem necessitating control indicates a fundamental and important change in the life of society. This change relates to the mushroom growth in complexities of existence. It is noticed in pressure and confusion. The stream of business and industrial life swirls daily into new nervous whirlpools; and the demand is growing that more compensatory measures for private life be developed to maintain an equable balance between the varied activities of living.

The isolation of sound is one such measure. Being largely psychological in its aspect, it has seemed less essential, heretofore, than the more obvious problems involving the organization of other planning factors. Excellent progress is being made toward criterions of structure and spatial efficiency. Problems of sanitation, light, ventilation and heat are being well met, and the solutions indicate a high degree of physical comfort. But the importance of questions involving mental and nervous reactions has not been, until recently, sufficiently recognized. Color, unity of arrangement, organization of time, conservation of human energy, the isolation of sound,—these all deal largely with the mental processes that influence physical action. They are questions, therefore, of great moment to the architect who is concerned with planning for private life. Upon him devolves the responsibility of organizing in terms of space and time physical entities in the production of a unity,—a unity which will, in turn, generate in its inhabitants a maximum of physical comfort and mental well being. The isolation of sound is recognized as a factor of increasing importance in this unity, and the solution of the problem it presents demands serious consideration.

FOUR PHASES

The apartment building as a unity peculiar to the present social structure is an established fact. Its purpose is the housing, for private family life, of an urban society. Within it, therefore, should be developed a maximum number of factors compensatory to the tension of public relations to achieve its proper function as a home, a place for physical comfort, nervous relaxation and mental pleasure. Sound isolation is a contribution to this function. Specifically, as a problem, it has four distinct phases:

1. The Psychological.
2. The Planning.
3. The Structural.
4. The Economic.

PSYCHOLOGICAL IMPORTANCE

This has been briefly indicated. Further investigation reveals that noise acts through the ear on the involuntary nervous system controlling the heart, the lungs and general metabolism. Tests under varied conditions show a lowering of efficiency in action and mental processes when noise is introduced, and a subsequent return to normal when the noise is removed. This seems to hold true in all cases, even when the noise has been tolerated for a sufficient time to be unnoticed as such. Sleep under noisy conditions has proved less generally recuperative than under conditions of quiet. It has been proved that quiet surroundings shorten the period of recovery from nervous strain. Rest is more profound, a tendency toward calmness and a lessening of mental distraction is noticed when noise is largely eliminated.

PLANNING

Insulation of apartment buildings against noises incidental to location may be accomplished in part by proper planning. Since walls act as an effective barrier to noise, the location of living spaces should be removed as much as possible from noise sources. The placing of service areas toward the street and the development of an interior garden court may accomplish this. Having many openings from the street to the court should be avoided. In large projects an arrangement of offset entrances to an indented court may serve as sound baffles. Air intakes should be located in quiet areas. Elevator shafts should be isolated from living quarters by corridors and stair wells. Bathrooms should be placed where sound is least likely to be heard, and plumbing lines should be located within the apartment that they serve and never within a wall separating two apartments.

STRUCTURAL INSULATION

I. Theory. Sound, a form of energy, is produced by vibration that travels in waves of varying velocities, depending on the medium. The denser the medium, the faster the sound will travel. Sound waves travel in solids, liquids and gases. "When waves in one medium encounter a second medium with a different elasticity or density, their regular progression is disturbed.

Part of the energy is thrown back in the form of reflected waves, part is absorbed in the second medium, and part is transmitted, the relative amounts depending on the differences in elasticity and density between the second medium and the first."[1] Sound waves may be transmitted in three ways: *First,* by passing through air spaces of a porous material, *Second,* by contact with a medium that in turn transmits a modified wave, and *Third,* by causing a minute vibration of a structure as a whole. Since sound is a form of energy, it cannot be destroyed. It must be transformed, and all solutions of sound isolation problems take this fact as a basis of procedure.

Laboratory experiments with materials of all types to determine their value as reflectors, absorbents and transmitters of sound disclosed three major facts:

1. Weight offers the greatest resistance to transmission.

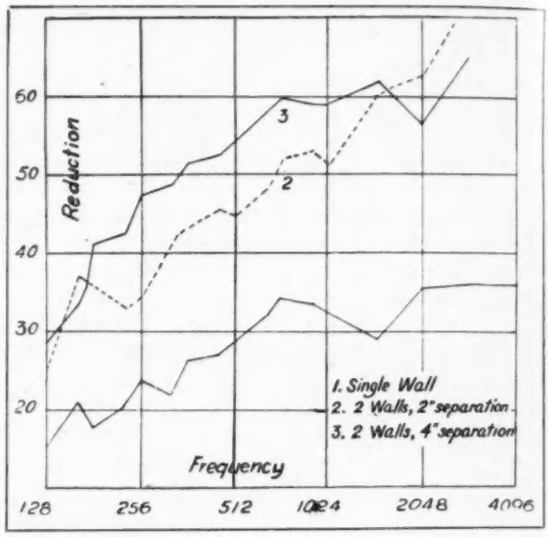
2. Porous materials absorb the most sound energy.

3. Hard, smooth-surfaced materials best reflect sound waves. These three statements relate generally to air-borne sounds. Various combinations of materials have been developed that, when used as walls and floors, reduce the transmission of such sounds between two rooms. Vibratory, or structure-borne sounds, are not as easily controlled. Watson states that: ". . . The theory of the subject is incomplete, and practical attempts to secure effective soundproofing are not always attended with success, even though the constructions used are in accord with the theory and apparently have the elements of adequate insulation. Sound progresses with facility through the different solid materials of a building in paths not easy to trace, and may be heard in positions quite remote from this source. This action, together with the extreme sensitivity of the ear, explains why the insulation of sound is a difficult matter."[2]

Sound is measured in "Sensation Units" (S.U.) or in "decibels" (dbs.). It has been demonstrated that the ear responds to the loudness of sound as the logarithm of the sound's physical intensity. (If one device, for example, produced 10,000 intensity units, it would require 100 devices to produce 1,000,000 units. Yet the ear would respond to the increased loudness only as the logarithms of those two quantities, 4 and 6, indicating the loudness of 100 devices to be only half again as great as one.) A sensation unit, or decibel, is the product of this logarithmic unit, or ear

[1] F. R. Watson,—"Acoustics of Buildings," 2nd Edition. Revised, pp. 4 and 5. John Wiley & Sons, New York, 1930.

[2] F. R. Watson,—"Soundproofing in Buildings," *Isolation,* Korfund Co., April, 1929.



P. E. Sabine

Fig. 1

scale, multiplied by ten. The range of sound measurement begins at the lowest point at which sound energy becomes audible,—the Threshold of Audibility; it ends at the upper level of maximum distinguishable intensity,—the Threshold of Feeling. Between them there is a scale of about 135 decibels. Ordinary conversation ranges between 35 and 65 dbs.

The penetration of a sound's intensity varies with the pitch. Sound vibrations cover a range of frequencies from about 16 to 21,000 per second, and the reduction factor of a given combination of materials in walls or floors will vary with even slight variations in pitch. (See Fig. 1.) In general, reduction is greater for high frequencies than for low. Since noise is composed of sounds of several frequencies, reduction values are usually given as the average of transmission tests in several frequency bands.

II. Practice. Sound control in apartments divides naturally into three groups:

1. Reduction of sound at its source.

2. Prevention of sound transmission through the structure.

3. Isolation of air-borne sounds from the area of audition.

Reduction of Sound at its Source. Since mechanical units generally produce noise, elevator machinery, blowers, fans, laundry machines, refrigerating and heating units should be selected for quietness as well as for efficiency of operation. Bathroom fixtures should be of the noiseless type. Sounds of running water may be lessened by the selection of pipes and connections adequate in size for the known velocity of water. Annunciator systems and door signals should be of the buzzer type. Checks on doors will prevent their

A Quiet and Restful Apartment Offsets the Effects of the Noise and Tension of Business Life. Buildings Facing Open Spaces Suffer Least from Reflected Street Noises

slamming, and care in the selection and installation of windows will reduce rattling and noises incidental to operation. Floors,—especially those of corridors and lobbies,—should be of a resilient material to prevent impact sounds.

PREVENTION OF SOUND TRANSMISSION THROUGH THE STRUCTURE. Several patented systems have been developed for insulating structure-borne sounds. As installed, they employ the principle of discontinuity of interior finish with the frame of the building by the use of absorbent sheathing and padded chairs or clips that support the interior finish and are designed to absorb and dissipate vibrations with the structure. Though many of them have been employed in the soundproofing of special rooms, radio broadcasting stations, schools of music, and for the correction of sound problems in completed buildings, their use in apartments has not become general. Fig. 2, 1 and 2 show partitions, and 5 and 6 floors that are typical of current practice. Several structural systems are in use for large projects. They combine some methods of sound insulation with the employment of pre-cast gypsum units for partitions, floors and ceilings. No reliable tests are available, but it is claimed that in addition to effecting considerable economies in construction they effectively reduce sound transmission. A common type of wall between two apartments consists of two tiers of 3-inch gypsum block separated by a 2-inch space in which are hung strips of felt, absorbent quilt, or a similar textured wall board. In some cases the space is filled with sawdust, rock cork, etc. Experience shows, however, that strips of any kind rarely add to the reduction value of the wall, and in the case of fill actually lessen it, as do ties or struts, by establishing a mechanical bond between the two walls. (See Fig. 1.) Furring strips on tile or gypsum block with the application of plaster over a fiber board base materially decrease transmission through single partitions and walls. Contact of walls with floors and ceilings should be prevented by the use of a cork or felt strip as indicated in Fig. 2, sections 1 and 2. Floating floors over the usual types of masonry and a furred ceiling plastered over fiber board reduce the transmission of impact sounds through floor constructions. Transmission of the noise of mechanical units may be lessened by setting machines on mats,—often made of alternate layers of cork, felt and lead, and sometimes supported on stiff spring clips,—which act as shock absorbers. Vents, pipes, soil lines, etc., should stand free of the structure wherever possible. Where they pass through floors and partitions they should be wrapped in felt, and hangers and braces should be applied over felt or porous rubber. Elevator shafts should be of very rigid construction, and the enclosing wall panels should be as nearly soundproof as possible.

ISOLATION OF AIR-BORNE SOUNDS FROM THE AREA OF AUDITION. Sounds within a room,—conversation, piano playing, radios, etc.,—may be reduced in intensity by the application, on ceilings or walls, of sound-absorbing materials. Cloth-

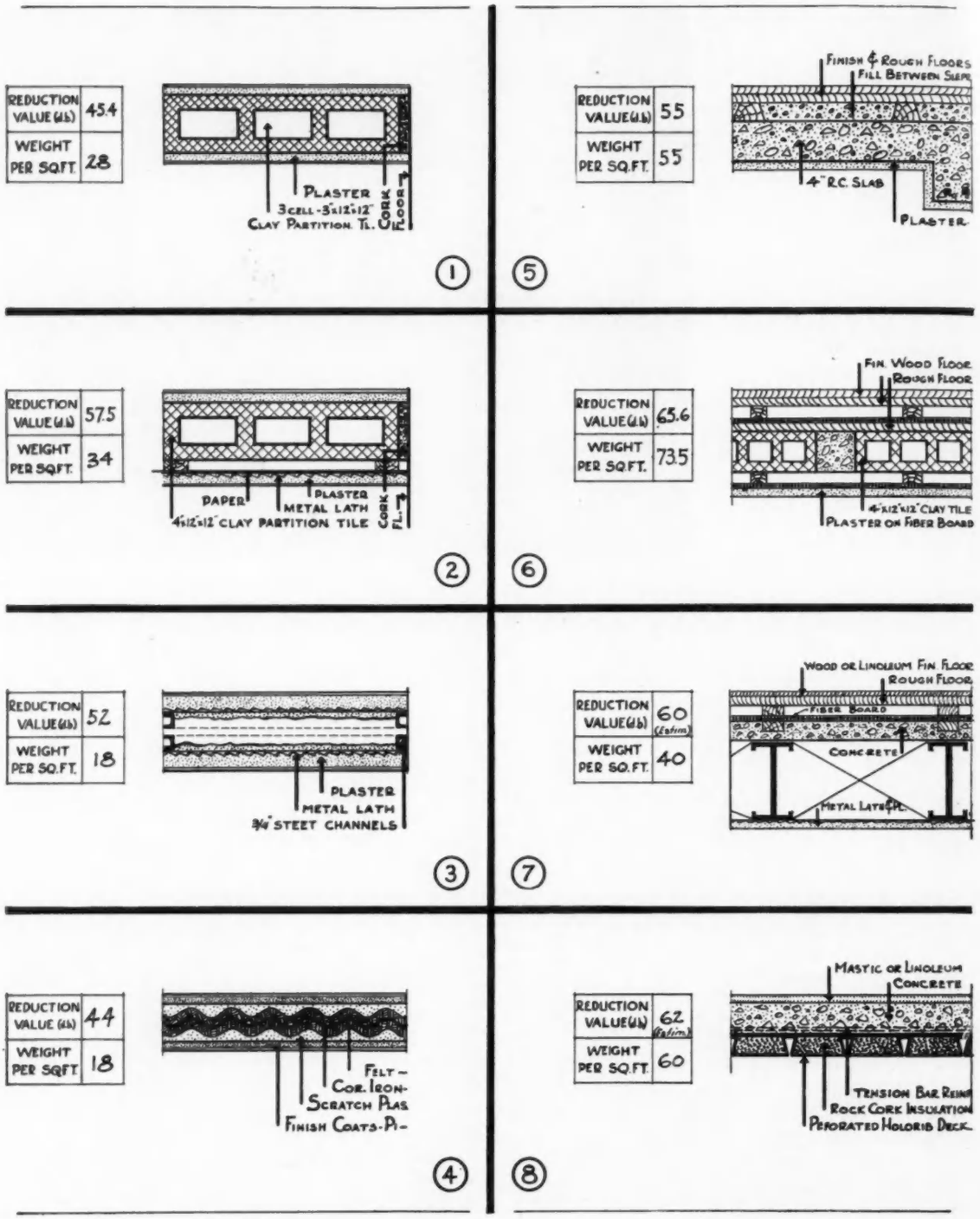


Fig. 2. Sections 1, 2, 5 and 6 Show Current Types of Wall and Floor Insulation. The Trend of Building Is to a Lighter, Less Cumbersome Structure. Sections 3, 4, 7 and 8 Show Possibilities of Combining Present Materials Toward This End

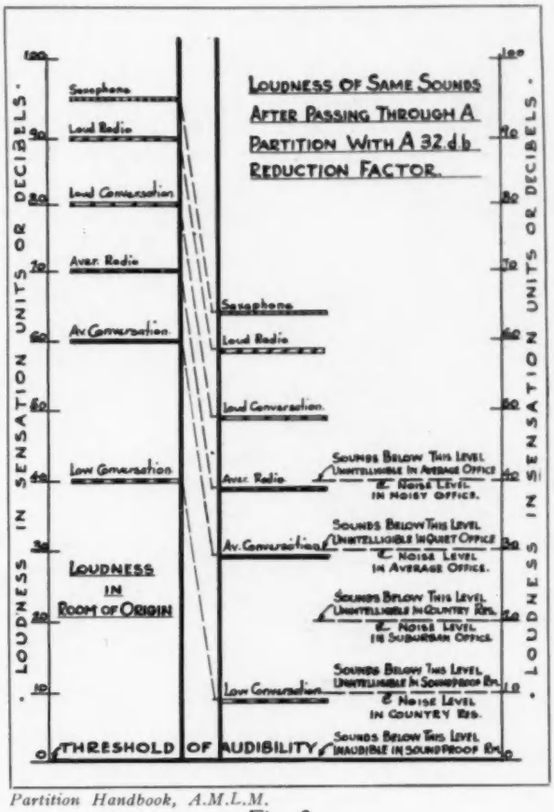
covered felt, rock wool covered with perforated metal, wall boards of cane or similar fiber, special acoustical plaster, loosely pressed composition tiles,—these are efficient in varying degrees. Rugs, draperies, furniture and people absorb considerable amounts of sound. Care should be exercised in the application of sound absorbents to prevent the creation of dead space without sufficient reverberation for aural comfort. Transmission of the noises may be reduced by using partitions and floors of the types mentioned. None can be especially recommended. Though many laboratory tests have been made, there exists a lack of practical data regarding reduction values for current types of construction. Field conditions vary greatly, and construction should be designed to produce the maximum efficiency for this and other factors involved. Doors of the usual type do not reduce sound greatly, and the consistent use of a sound-insulated type is important. To prevent travel of sound in ventilating systems, outlets from a single duct should alternate to individual apartments. Duct and fan connections should be of canvas. Air chamber or machinery noises from intakes may be reduced by using a series of baffles in the chamber or by the use of felt as an absorbent lining in the ducts.

The isolation of traffic noises constitutes a serious problem. All efforts to insulate for airborne sound may be nullified by intrusion of harsh street noises through open windows. Methods to exclude such noises are few. In some cases balconies may serve as sound barriers, and in some buildings a patented device has been installed on the exterior sills to accomplish the same purpose. In tests it shows a reduction of about 9 dbs. per window. Though this may prove adequate in some instances, the amount of ventilation obtained while still receiving the benefit of sound exclusion is limited. If the exclusion of outdoor noises is an important factor, windows should be stationary, and the mechanical ventilation of the building is indicated.

If the sound level of known conditions is established, it is possible to obtain another desired level by the use, as sound insulators, of construction units of known reduction values. These quotations, from the Bureau of Standards, are self-explanatory.

"Panels Whose Reduction Factors are Over 60 Sensation Units: Conversation carried on in an ordinary tone is reduced to inaudibility. If there is external noises in the listening room, a shout on the other side of the panel would be practically unnoticeable.

"Panels Whose Reduction Factors Lie Between 50 and 60 Sensation Units: Conversation in ordinary tones heard through the panel is barely audible, but unintelligible.



Partition Handbook, A.M.L.M.

Fig. 3

"Panels Whose Reduction Factors Lie Between 40 and 50 Sensation Units: Conversation in ordinary tones heard through the panel is quite audible, but difficult to understand. If the voice is raised, it becomes intelligible.

"Panels Whose Reduction Factors are Less Than 40 Sensation Units: Conversation in ordinary tones heard through the panel is distinctly audible and intelligible.

"The above comparisons are based on tests in a listening room in which there was no noise and which was quite reverberant. In a room furnished with rugs, draperies, or other sound-absorbing objects, the panels would be apparently more effective than when tested in bare rooms.

"Attention must be called to the masking effect of external noise. If a panel having a reduction factor between 30 and 40 sensation units is taken as an example, the following facts may be noticed. If there is no external noise and the panel acts as the wall between two rooms which are fairly reverberant, it is quite easy for two people who are on opposite sides of the panel to carry on a conversation, but if there is the slightest noise in the room where the person is listening, the conversation becomes a mumble, and the chances are that not a single word will be understood. The louder the noise the greater the masking effect.

From the above it is readily seen that a panel might give entirely satisfactory results under some conditions while under other conditions it would be entirely unsatisfactory. In other words, the conditions under which a structure is to be used are to be considered, as a given structure may seem satisfactory or unsatisfactory as these conditions are favorable or unfavorable." *

ECONOMIC VALUE

The complete use of sound insulation systems in apartment buildings has been limited, due to (1) complex installation, sometimes causing confusion in the field, (2) the fact that they occupy an appreciable amount of space, thereby cutting down rentable area to some degree, (3) additional cost implied by the foregoing, and (4) the unwillingness of owners to install such systems unless forced to do so by public demand or by unsatisfactory sound conditions in a completed building. Walls between apartments, elevator shaft enclosures and bathroom partitions are usually insulated to some degree, depending upon the location, the type and the cost of the building. Regarding such questions as possible increase in rents, prevention of early obsolescence, and the development of a preferred location resulting from the use of sound insulation, no reliable data are obtainable. Surveys should be made for every project to determine the relative importance of these points with others involved.

It is believed that public demands for adequate sound insulation in apartments will shortly become insistent. In New York City, the Noise Abatement Commission has made an extensive survey of the causes and prevention of street noises and is advocating legislative control of noise where possible. A committee of the American Society of Mechanical Engineers is investigating the causes of machinery noises and is endeavoring to fix a standard of sound by which machines can be graded. Both efforts are fundamentally economic, and indicate the importance of the subject from this standpoint. Quietness usually tends to increase values in a given locality, and programs or methods to promote it have a certain economic worth. A statement of this necessitates a close relation with other influences, and any other procedure is mere guesswork.

SUMMARY

I. Sound insulation in apartments constitutes a complex problem. Economic and structural questions vary in every case and require study. If sound insulation is to be procured, methods must include three parts:

1. Reduction of noise at its source.
2. Prevention of sound transmission through the structure.
3. Isolation of air-borne sounds from the area of audition.

Construction that provides for two of these parts may prove ineffective if the third is neglected. In many cases a standard method may prove unsatisfactory, and difficulty may be encountered under any or all headings. In such cases a searching technical analysis, an unbiased use of methods and materials and extremely close field supervision offer the only means of obtaining satisfactory results.

II. Future development of materials may do much toward the securing of quiet apartment buildings. A deep inquiry into sound insulation problems discloses close association with several others. If the subject of sound insulation in apartments becomes of vital economic importance, subsequent construction methods will greatly influence current practice in heating, ventilating, sanitation and structural design, with a possible departure from present plan requirements and a consequent radical change in exterior expression.

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*Chrisler, V. L. and W. F. Snyder,—"Transmission of Sound Through Wall and Floor Structures." Research Paper No. 48, pp. 548 and 549, Bureau of Standards, Washington, 1929.

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THE RESIDENTIAL DISTRICT GARAGE

BY

A. T. NORTH

PRACTICALLY all zoning regulations and building ordinances outlaw the parking garage from urban residential districts. There is, however, an actual necessity for having parking garages in multiple-dwelling residential districts to contribute to the convenience and comfort of their inhabitants. Parking garage accommodations also enhance the rentability of multiple-dwelling buildings, provided they are unobjectionable in appearance and operation.

There must have been valid reasons, sustained by popular approval, for declaring parking garages a nuisance occupancy in residential districts. The ordinary commercial parking garage building was cheaply constructed and architecturally unattractive. These undesirable features are often further added to by the noisy operation of the garage, conducted by ill-kempt operatives. To these undesirable features there may be added unsightly gasolene pumps and the characteristic over-illumination at night.

Architects and garage engineers are today designing parking garages that are acceptable in residential districts and that are distinctly fine architectural contributions to their neighborhoods. These buildings, with high class management and operation, have definitely removed the parking garage from the nuisance occupancy class. In some cases there were objections to their construction, resulting in litigation. The courts evidently held that with proper design and operation, sufficient safeguards were provided for the protection of the surrounding property. The number of adequately designed parking garages is limited, but they are widely distributed geographically, which indicates the universal necessity for this class of buildings. Different solutions of the problem have been made, tributes to the ability of the architects.

Rittase

Lawn on Garage Roof, Garden Court Apartments.
Ralph B. Bencker, Architect

A notable example of the parking garage in close proximity to high class apartment buildings is that of the Garden Court Apartments occupying the city block bounded by 47th, 48th, Pine and Spruce Streets, Philadelphia, Ralph B. Bencker, architect. The project consists of seven apartment buildings facing the different streets. The central

Rittase

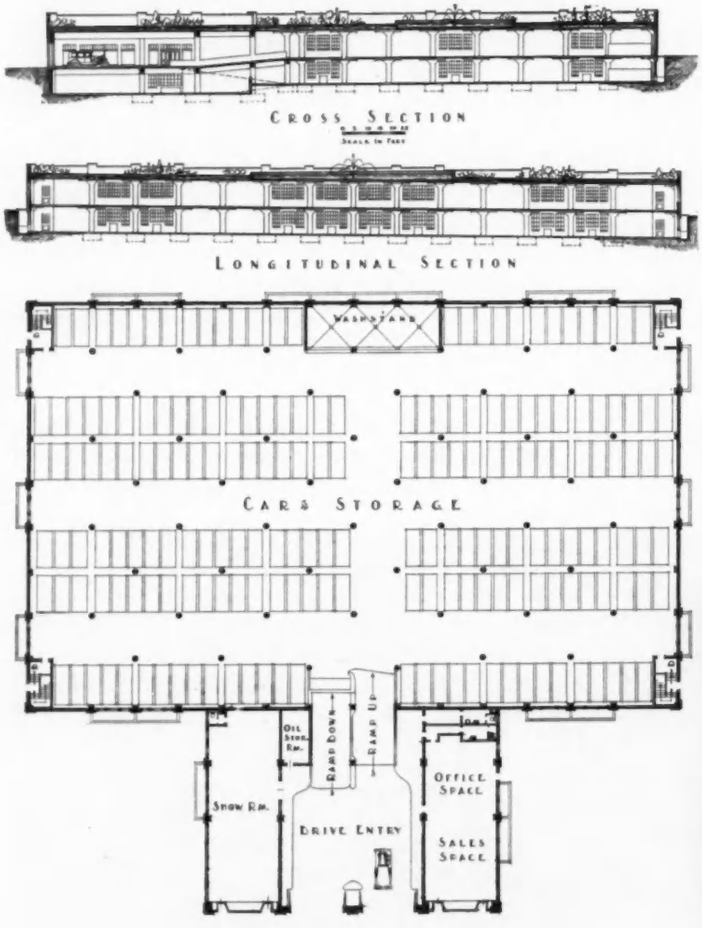
Entrance to
Garden Court Garage

Rittase

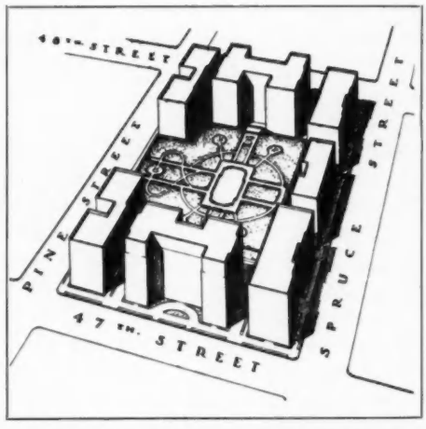
Lily Pond on Garage Roof

portion of the block is occupied by a one-story and basement garage building. The entrance to the garage, on Pine Street, is flanked by a one-story store room on each side. The roof of the garage, one story above ground, is pitched to drains and finished with a membrane waterproofing covered with asphalt. A concrete curb about 2 feet, 6 inches high forms a lily pond which also contains a small fountain. Eighteen inches of soil is placed on top of the roof, which is planted for turf and flower beds. The roof of this garage forms the garden court and presents a pleasing aspect to the surrounding apartments. Exhaust fans remove the engine fumes through vent ducts in the adjoining buildings. In this instance the garage is secluded from the adjoining buildings and streets, except for its entrance and exit, and the garden is an attraction added to that of the convenience of the garage.

The problem of the parking garage adjacent to apartment buildings was solved in a different manner in the Homewood Garage, Baltimore, Palmer, Willis & Lamdin, architects. This garage building is placed on one side of a city block and is a detached structure. The remaining portion of the block is occupied by apartment buildings. It is an exclusive neighborhood, adjoining the new site of Johns Hopkins University. Entrance



Garden Court Garage

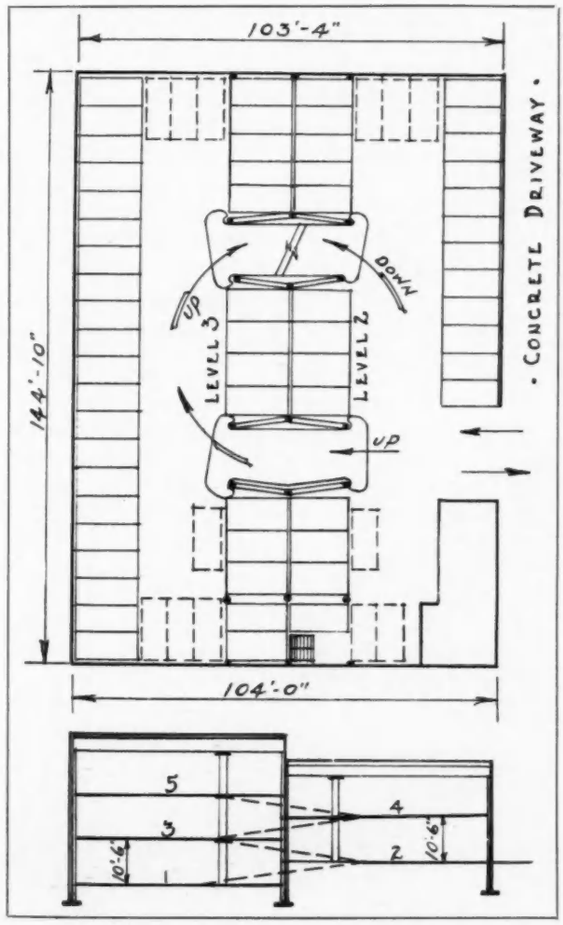


Garden Court Garage. Above, Block Plan Perspective; Below, Interior of Garage

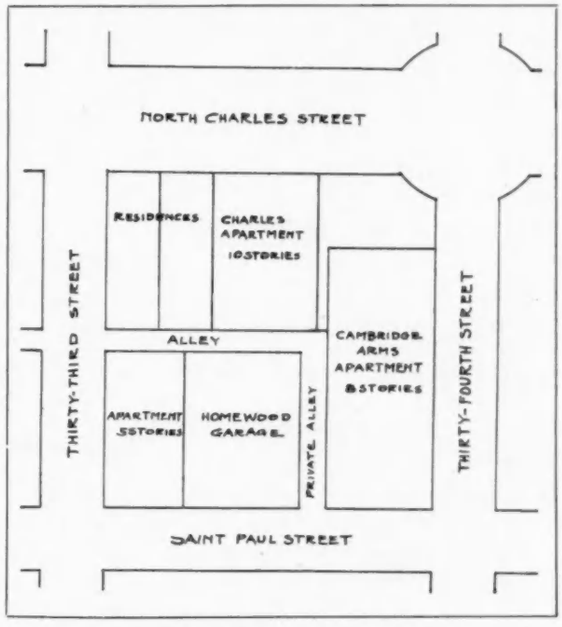
Rittase

Leopold

Homewood Garage, Palmer, Willis & Lamdin, Architects. Garage Building in Center, Surrounded by Apartment Houses



Homewood Garage, Plan and Section



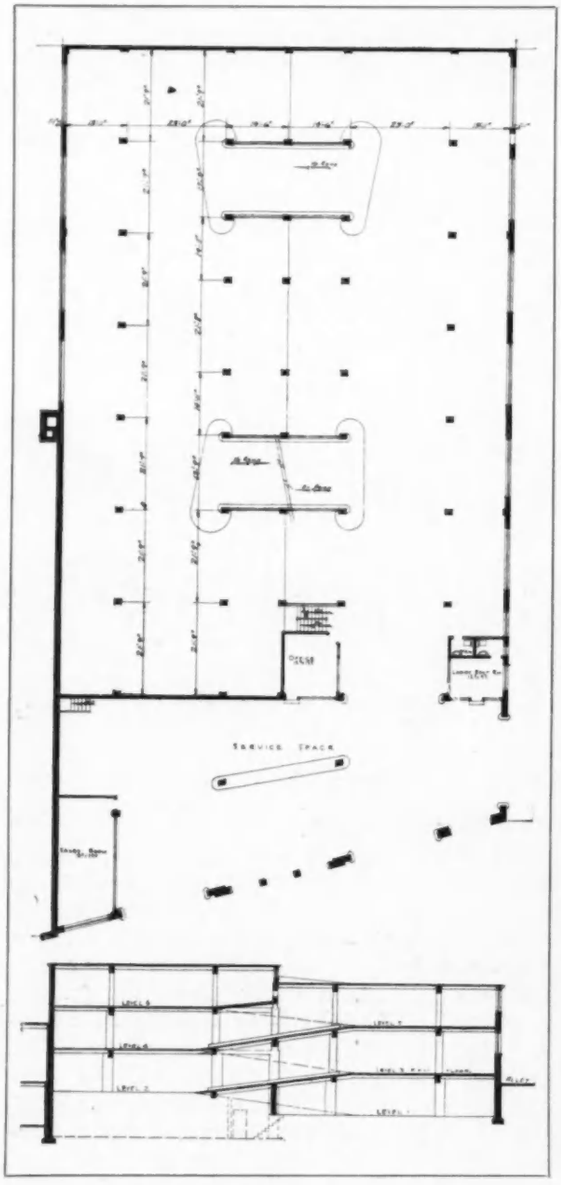
Homewood Garage, Block Plan

to the garage is in one side of the building from a wide concrete driveway leading to the street. The street elevation is severely plain, having a series of finely proportioned arched recesses in the wall. An entrance for pedestrians is placed in the center of this elevation. The whole conception has been designed and constructed in a dignified, simple manner, appropriate to the neighborhood.

In restricted residential districts provision is made usually for a small business center conveniently located, in which there is a parking garage. The Ward Parkway Development, Kansas City, has such a garage, designed by E. W. Tanner, architect. Two entrances on the front and one on the side provide access to the building. In the front portion are located the gasolene pumps and service station. There are no signs, oil pumps, or other garage features to indicate the specific use of this attractive commercial structure.

Tyner & Murphy

Ward Parkway Garage, E. W. Tanner, Architect



Ward Parkway Garage, Plan and Section

Large apartment buildings are being constructed in old, exclusive residential districts made up of one-family city dwellings, such as the Rittenhouse Square section of Philadelphia. As the parking garage is a necessary adjunct to the high class multiple-dwelling house, the Rittenhouse Square section is served by the Plaza Garage, formerly the Aldine, located on Sansom Street, the Ballinger Company, architects. This building is of the ramp type, with two stairways and a passenger elevator; garage office, waiting rooms and toilets on the first floor, and chauffeurs' room on the roof.

The parking garage has been incorporated successfully in high class apartment buildings. The advantage of this arrangement is that a direct and convenient connection, by elevator, is provided between the apartments and the garage. The type of construction used is such that the garage por-

Plaza Garage, The Ballinger Company, Architects

Rittenhouse Square
1. Plaza Garage
2. Chatham Hotel
3. Rittenhouse Plaza
4. Wellington
5. Warwick
6. Embassy
7. 2031 Locust Street
8. 1900 Rittenhouse
9. 1830 Rittenhouse
10. 18th and Rittenhouse
11. 19th and Spruce Streets
12. Warburton House
13. 18th and Walnut Streets
14. Latham

Dallin Aerial

tion is effectively insulated from the rest of the building for noise, fire and fumes. Of this type, reference is made to the Continental Apartments, Arsenal Square, Cambridge, Charles R. Greco, architect. About 40 per cent of the ground area, a rear court, is occupied by a garage in the basement and sub-basement, each with direct access to the street. The Longwood Towers Apartments, Brookline, Mass., Harold Field Kellogg, architect, and the Park Mansions Apartments, Schenley Park, Pittsburgh, T. R. Hinckley, architect, are important examples of the inclusion of the garage in the apartment building.

The residential district parking garage is operated exclusively on the 24-hour monthly contract system, having little transient business. Experienced observers are of the opinion that it operates on as profitable a basis, by and large, as the business-section commercial garage. The land investment is comparatively small. The established confidence in the operator results in additional revenues, frequently amounting to more than 60 per cent of the total receipts, from the sale of accessories, gasolene, oil, washing, lubricating and other services.

It is necessary and proper to define legally the permissible locations of garage and other business occupancies by zoning laws. It is demonstrated that in high class multiple-dwelling residential districts, the parking garage is a social and economic necessity. It follows, then, that some legal method must be found to permit their construction that will insure the conservation of property values and the peace and comfort of the people. In formulating a method of legalizing their construction it must be remembered that a prohibition under ordinary conditions always enhances the value of its violation. Under some existing methods of legalizing violations of building ordinances and zoning laws, these valuable privileges have become a matter of barter and trade because of improperly constituted authority. The dismissal of injunctions has proved to be a successful method under existing laws, entailing the loss of valuable time and undue monetary expense to which no one should be subjected. Possibly a solution of the problem of these zoning laws or building ordinance violations would be to establish certain legal requirements as to architectural design, mechanical equipment, sound insulation, fumes disposal, fire protection and character of operation, and the adjudication of the zoning law violations to be made by an established method of arbitration between all of the parties interested.

Willoughby

Continental Apartments, Charles R. Greco, Architect. Entrances to Garage at Left, Ramps Up to Basement and Down to Sub-Basement Levels. Garage Under Interior Court

Willoughby

Garage Incorporated in the Apartment Building, Longwood Towers, Brookline, Mass. Harold Field Kellogg, Architect

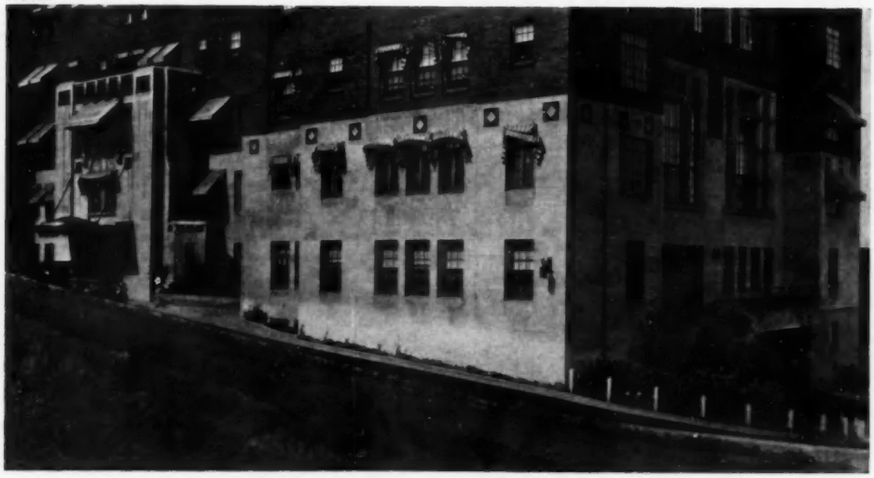
Hess

Interior Park Mansions Garage

Willoughby

Longwood Towers Garage Interior

Hess



Elevators Direct From Apartments Have Small Lobbies in the Garage

Entrance to Apartments Upper Left, Entrance to Garage Lower Right. Park Mansions, Pittsburg. T. R. Hinckley, Architect

SELECTING APARTMENT ELEVATORS

BY

W. T. WHITE *

PARALLELING the growth of the apartment building has come the development of the "Tenant-Operated" elevator. First we saw the familiar standard straight push button type which still finds its place in the scheme of things in spite of the fact that it is essentially a "one-man" car, or as someone has said, it is "one for all and all for one," one after another. Second was developed the modern Two-Button Multicall type, today's great forward step, in which almost all the advantages of an operator-controlled car may be available to the public, providing both power-operated car and hatch doors are installed. Then came three modifications of this control: First, the Single-Button Multicall, developed to give to the small apartment house many of the advantages of the Two-Button type at about the price of the straight Push Button type; another, the Two-Car, Two-Button Multicall Control which extends the advantages of this type to a bank of two elevators controlled from a single riser of corridor push buttons; and finally, the Personal Service feature designed for apartments of the highest class where an attendant is provided to watch over and assist the passengers. For the skyscraper apartment hotels and coöperative apartment buildings the standard operator-controlled cars which have been developed for the modern office building, are available, and arranged for either car switch operation with level landing or for Full Automatic Control.

Fortunately the intense activity in the building and development of apartments has failed to curb individual expression. The present-day apartment house or apartment hotel has grown to be "home" for many of us. There seems to be just about as much variation in apartment houses as there is in private homes, and so it is with the elevator requirements. The type of elevator service rendered must make its appeal to the tenant through his home life, which is distinct and different from his business activities. Does he come from a former home where he has been accustomed to have servants to wait upon him? Then in general the "Tenant-Operated" elevator is not for him, unless it be equipped with the "Personal Service" feature. Is the building speculative in character? Then the equipment may have to be selected almost entirely on a price basis, but here sufficient consideration must also always be given to sound engineering principles. In other cases the owner may wish to make his building outstanding in character, but he must not be unduly influenced by the spectacular without due regard for fundamentals.

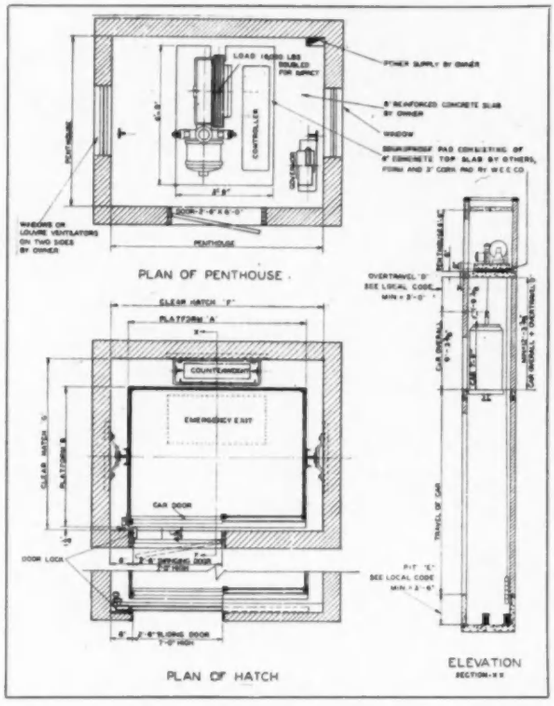
*General Engineer, Westinghouse Electric Elevator Co.

FUNDAMENTALS. What are these sound engineering principles, these so-called fundamentals? Let us list the major characteristics of an apartment house elevator in the approximate order of their importance.

They are: (1) Safety, (2) Reliability, (a) Accessibility, (b) Ventilation, (3) Quietness of Operation, (4) Appearance, (5) Type of Service Rendered, (a) Convenience, (b) Control, (c) Traffic Handled, (6) Standardization, (a) Costs.

1. **SAFETY.** Safety is of the utmost importance in apartment houses, because it affects the passenger at home where it involves the safety of the family, children as well as adults. Standards of practice which would be relatively safe for adults would be unsafe in elevators used frequently by children and old persons. Particular attention should be paid to safety where the elevators are "Tenant-Operated" and no operators are in attendance. Some of the factors which determine the safety of an elevator are not always appreciated. For example, in some cases in order to match up with the rest of the corridor trim, the swinging elevator hatch doors have been so mounted that the distance from the car platform door to the corridor door has become large enough to permit a child to step onto the threshold and then allow both doors to close. Under such conditions, a "Tenant-Operated" elevator might easily move away to answer another call, with possible disastrous results.

It is natural and well within the realms of possibility for an elevator to stop between floors, due to setting of the safety, or to pass the top or bottom floors due to overload or control failure. Provision should be made so that a hoistway door may be opened from the outside by an attendant to allow the removal of passengers. The elevator should be equipped with a call bell so that passengers may send for assistance. Hoistway doors may be either of the sliding or swinging type and should be self-closing. For "Tenant-Operated" cars the car gate or door should also be equipped with a reliable closing device. The present trend



Penthouse and Hatch Layout for the Standardized Apartment House Elevator

is toward a power-operated car door. Solid doors should be used when power-operated, since fingers may be hurt if caught in a scissor-type power-operated gate.

2. **RELIABILITY**. Reliability of operation is of great importance in an apartment house because the service is frequently dependent upon a single elevator. In the hall type of apartments, two elevators may be grouped together to give service to a number of apartments on the same floor. The design of many apartment houses, however, is such that only one or two apartments can be served from a single elevator. This arrangement is often desired because of the privacy obtained. It has a disadvantage, however, in that the service is dependent upon a single car, and a shutdown would render this group of apartments without service. In some cases where service elevators are installed, they are so arranged that entrance to the apartment is obtained only through a kitchen or butler's pantry. In one particular apartment house, the passenger elevator in the front and the service elevator in the rear were purposely made to open upon a communicating hall. It was the practice of this building when a shutdown occurred in a passenger elevator, to lay a carpet on the floor of the service elevator which had purposely been equipped with a rather good cab, and use this elevator as a passenger elevator. Guests could then be escorted to this elevator and from the elevator to the front door of the apartment which they were visiting.

Another factor which greatly increases the reliability of service is to have all machinery in an accessible place. A secondary sheave or governor located beneath the main penthouse floor and in such a small space that it is very difficult to get at, is apt to be neglected. Ventilation is of great importance, and this, too, is frequently neglected. The insulation of electrical machinery will stand certain working temperatures for a long period of time. If this temperature is exceeded, deterioration may in some cases be very rapid. It frequently happens that machine rooms which are poorly ventilated are for the same reason very inaccessible. Repairs are not only expensive and difficult to make, but delay may be involved which will be detrimental to service, particularly where the whole building is dependent upon a single elevator.

3. **QUIETNESS OF OPERATION**. It is common knowledge that machinery for apartment house work should be particularly quiet in operation.

4. **APPEARANCE**. The appearance of the elevator, such as the cab, accessories and entrances are of as great importance as smoothness of operation, elevator speed and capacity. The tenant frequently knows nothing about the elevator at all except that it has a beautiful cab and other appointments, which, of course, should

Class No.	Type of Bldg.	No. of Floors	Type of Equip't.	Speed FPM	Capacity of Car	Control	Door Equip't.	
							Hatch	Car
1	Apt. House	Up to 6	Geared Rhe. Single Spd.	125	1500-1750 Lbs.	S. Button Multicall	Hand Closer	Power Operated
2	Apt. House or Apt. Hotel	5 to 8 8 to 15	Geared VV Geared VV	300 400	1500-2000 Lbs. 1500-200 Lbs.	*2-Button Multicall CS VV * Dual	Power Operated "	Power Operated "
3	Apt. Hotel or Coop. Apt	15 to 20 Over 20	Gearless VV Gearless VV	500 600	2000-2500 Lbs. 2000-2500 Lbs.	* CS VV Dual Full Auto. (signal)	Power Operated "	Power Operated "

* Or Two Button Multicall with Personal Service.

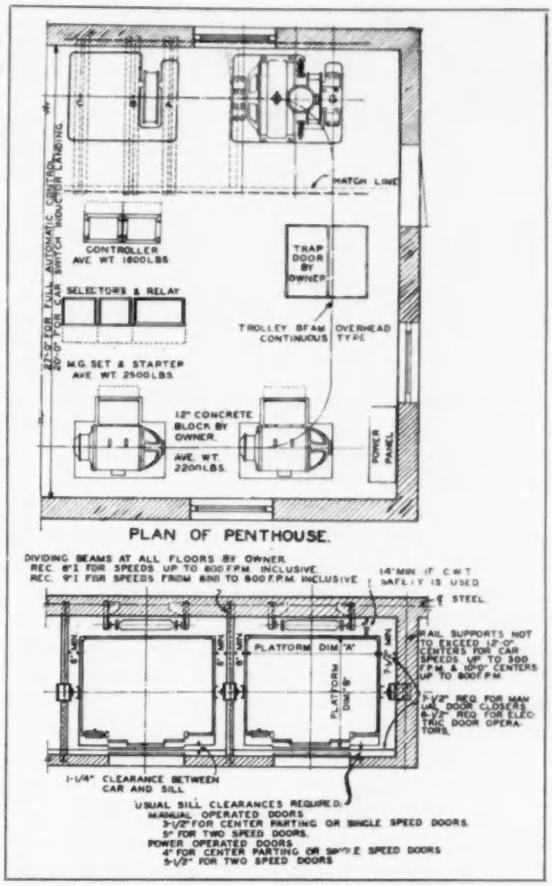
be in harmony with the building decorations. Proper attention to these details will enable the elevator equipment to attract tenants by first impressions and hold them afterwards by performance.

5. **TYPE OF SERVICE RENDERED.** The service rendered should be consistent with the type of building and conform to the building standards. The service outlined is recommended.

The elevator must be convenient to use if it is to be of the "Tenant-Operated" type. For this reason power-operated doors are recommended in the given outline wherever the cost is in keeping with the character of the building. The development of the Personal Service feature has been brought about largely through the desire of the owner or manager to make the elevator service as comfortable and convenient as possible for his tenants. The types of control, as listed here, are in general to be recommended, but variations are oftentimes acceptable. Any elevator manufacturer would welcome the opportunity to investigate and make unbiased recommendations.

THE TRAFFIC PROBLEM in apartment houses is seldom one in which the number of passengers to be handled has a great deal of bearing upon the equipment to be used. The problem is frequently one of psychology rather than traffic, and the service to be rendered is more one of personal service to the individual than it is of general service to the building. The lack of appreciation of this fundamental principle has been the cause of many misapplications. The speeds of elevators, for example, are determined not only by the time required to carry a passenger from an apartment to the street, but also upon the effect of this speed on women, children and elderly persons.

It is assumed that there will always be at least a service elevator available in case it is necessary to shut down a passenger car for any cause. The desirability of incorporating in the building plans such arrangements as to make the use of this service car convenient and comfortable for the tenants has been touched upon under Reliability. Where more than one elevator is provided, it is desirable that they be placed in adjacent hatches wherever possible. Of course, such an arrangement is out of the question with certain types of buildings where each section or wing may be provided with its individual elevator. In such case the availability of the corresponding service car must be carefully studied. The actual number of passenger cars required to give adequate service in the many varying types of apartment buildings, apartment hotels and coöperative apartments should be given the most careful attention. The leading manufacturers maintain engineering staffs, available to the owner or architect. When consulted, they should be given all of the essential data, including the location and type of the building, the kind of competition, the type and habits of the tenants if possible, the number and sizes of the apartments and the approximate number of tenants, plans of the first or lobby floors and the various typical floors, with an elevation giving floor heights.



Typical Passenger Elevator Layout. Plans of Penthouse and Hatch

6. **STANDARDIZATION.** There is a definite economic need for a high quality elevator designed and built especially for the service indicated under Class 1. Apartment houses of this type have yielded to mass production methods. Thus it follows that the elevator equipment must necessarily be cheaper than other types, and first cost and maintenance must be kept lower. To obtain for a lower cost and smaller maintenance charges an elevator which is safe for women and children to operate, reliable, quiet, smooth in running and with small space requirements, it is necessary that equipment be selected that has been specially designed for such service and which is the result of considerable study and experience on the part of the manufacturer.

POLICY AND OPINION

UGLY BRIDGES

BRIDGES appear to be receiving general attention, as was indicated by an editorial in the New York *World*, August 25, 1930, which makes specific reference to the new Poughkeepsie Bridge. This editorial contains two statements to which exception may be taken as being unsound and dangerous to the promotion of æsthetic bridge design. One statement: "Yet with regard to the appearance of bridges, we have often wondered whether it is possible to build an ugly one." Ugliness, of course, is susceptible to definition as applied to bridges. By and large, it is evident that bridges of all kinds as disposed throughout this country are unparalleled examples of ugliness. Efficient? Yes, the American engineer gets the maximum work from every ton of structural material used,—that is economical designing, of which we are proud,—but beauty has not been a consideration. The wonder is, rather, that it is possible for us to build a beautiful bridge.

Again: "All bridges are beautiful because of the nobility of their function, something that transcends even the worst blunders of design." Nobility of function does not necessarily establish beauty of structure. A battered box car or a dilapidated gondola car transports food to the starving or coal to the freezing,—both noble functions of charity and mercy,—but are these cars structurally beautiful? The principle involved, in bridges or even chairs, is applicable to the innumerable structural forms that properly, adequately and economically serve their purpose, but from these a *selection* must be made that is good looking. Man's handiwork, *per se*, has no inherent beauty. Beauty is the resultant of certain qualities introduced intentionally.

American bridge engineers have failed pitiably to incorporate beauty in bridges. The few bridges that do possess that quality serve but to accentuate this failure. Engineers collaborate frequently with architects in European countries, and the good results are readily apparent in a study of European bridges. Collaboration between engineers and architects is rare in this country. In some cases it has improved decidedly the æsthetic design of bridges. It is a question as yet as to just what our architects can contribute to the betterment of bridge design. Their failures appear to be a lack of understanding of the function of the parts of the bridge and a failure to dissociate their conception of a building with its stylistic accessories. There is, however, a growing appreciation of the problem of the æsthetics of bridge design among architects and engineers that must lead to the betterment of American bridges. A. T. N.

PLANS AND RENTS

A CRITICAL study of the American apartment building as a type discloses two obvious characteristics,—plan and architectural design. The apartment building is a distinct type that has been developed apparently to satisfy the ideas and demands of the tenant occupants. Rentability and earning capacity are the principal factors that influence the design. Thus the economic interests of ownership rather than appropriate architectural design are the causes of the apartment building's present status. These justly may be the premier considerations, but it *is* entirely possible to associate financial success with the finest quality of architectural designing in every kind of income-earning building.

Rentability depends chiefly on two factors,—location and plan. Every tenant desires the most comfortable and convenient quarters purchasable by his rent-paying ability. Competition for tenants has resulted in the development of plan arrangements and mechanical equipment that best satisfy these two desires. As a result, the plan of the American apartment as a type is probably the most comfortable and convenient of any. Competition has compelled also the development of the most economical,—not always the best,—kind of construction. Plan and construction, then, have been classified and standardized, in a measure, into the several grades or classes of apartments in keeping with the procurable rentals. Recognizing the social and economic necessities for the several grades or classes of plan and equipment, it is acknowledged that the apartment house plan has been developed to a high state of perfection. The standardizing of plans has made it possible to produce them at a surprisingly low cost.

In these studies, it is found that the characteristics of plan and construction vary in the different sections of the country, indicating the influence of local conditions as to materials, methods of construction, building laws, social customs and methods of financing.

SMALL KITCHENS FOR APARTMENTS

BY

ROGER W. SHERMAN

REDUCED to its simplest terms, a kitchen exists as (1) a place in which to prepare food, and (2) as a place where dishes are washed and put away. In addition, it provides storage for food, utensils and cleaning articles. Apartments are tenanted by people with interests other than a personal and meticulous upkeep of a complicated establishment, and the arrangement of equipment to serve the purpose of a kitchen with the minimum of time and effort is of great practical value.

GENERAL FACTORS INFLUENCING DESIGN

1. SIZE, SHAPE AND LOCATION in relation to living quarters, corridors, ventilation, daylight, heat and water supply. These will be determined by the factors of location, cost, size of units, rental scale or selling prices, and percentage of equity return governing the choice of building types.

2. EFFICIENCY OF EQUIPMENT ARRANGEMENT. Experiments in home laboratory kitchens* have established the value of a scientifically compact area where all equipment is available with a minimum of motion and effort. Location of work counters, food, utensils, sink and stove should be governed by this principle. Sinks should have drains or counters on both sides where possible; if not, the drain should be at the *left* of the sink. Cabinet and refrigerator doors should swing in a direction to expose interiors most naturally from the center of the working area.

3. COMFORT OF OPERATION. A minimum working space of about 30 inches between fixtures is necessary for kitchen work without strain. Cabinets above a height of 7 feet are of little value where space does not permit the use of a small portable step-ladder. Ideally, the heights of counters, sinks and stoves should be adjustable, but a counter height from the floor of 34½ inches should be specified as suitable for the average person. Catches on cabinets should be positive, but easy to operate, such as the bullet type; and drawers should be of metal to prevent sticking. Confusion in unit door swings and inaccessible corner cupboard space should be avoided. Floors should be quiet, durable and resilient, such as linoleum, cork or similar compositions. Light should be evenly diffused, and fixtures should be placed so as to avoid shadows within the work area. Wall plugs above counters permit the use of various kitchen appliances and should be specified and their location shown on plans.

4. MAINTENANCE. Equipment should be selected for convenience, minimum of upkeep, and possible salvage value. Cabinets and shelving should be units of standard approved manufacture, avail-

*Spatial efficiency and labor saving methods are being intensively studied by housing engineers throughout the country. Results of scientific experiments with kitchens by experts of the Good Housekeeping Institute and the Herald Tribune Institute constitute the authority for many of the statements contained in this paper.

The Small Kitchen Should Conserve Space, Time and Human Energy. Arrangement Shown Is Wasteful of All Three. Locations of Both Sink and Range in Relation to the Cabinet Are Inconvenient. Counter Space Is Inadequate and Poorly Placed. Mechanical Refrigeration Is Preferable. Storage Space Is Wasted Under the Stove and Sink, and Two Broom Closets Are Unnecessary. The lighting Would Cause Shadows Over All Work Areas

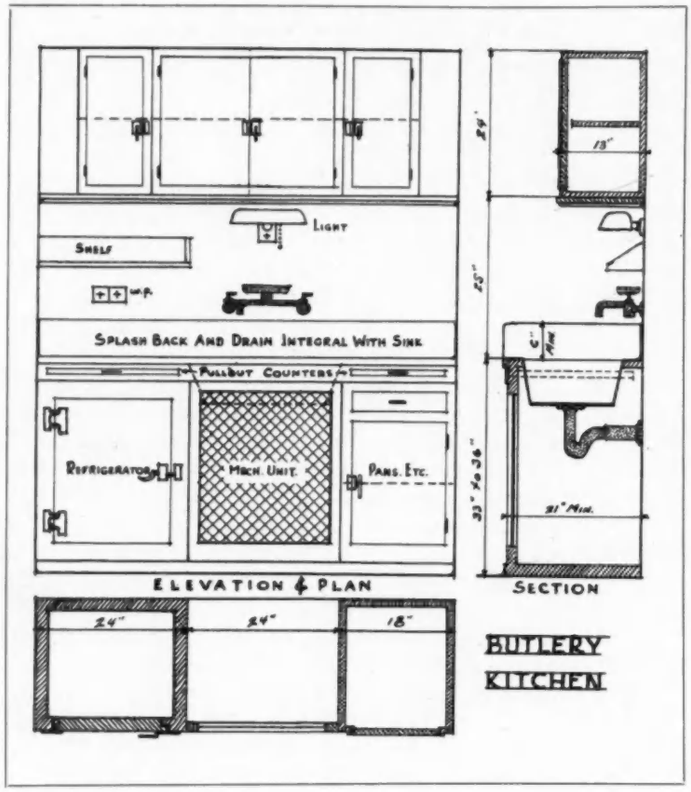
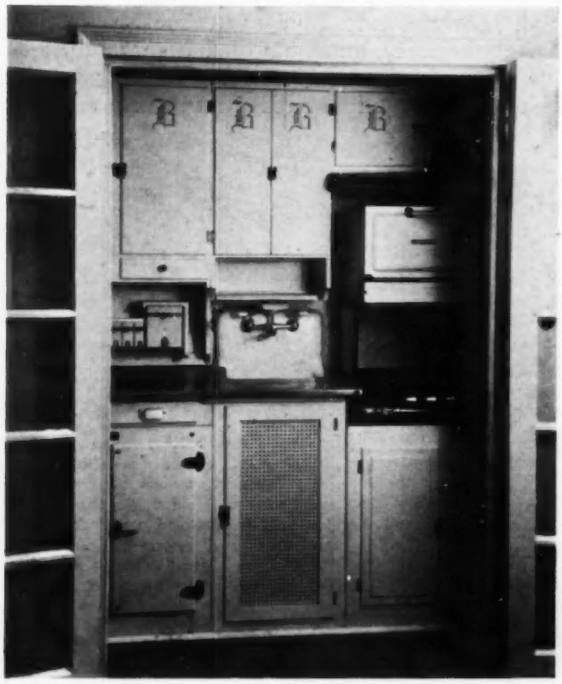


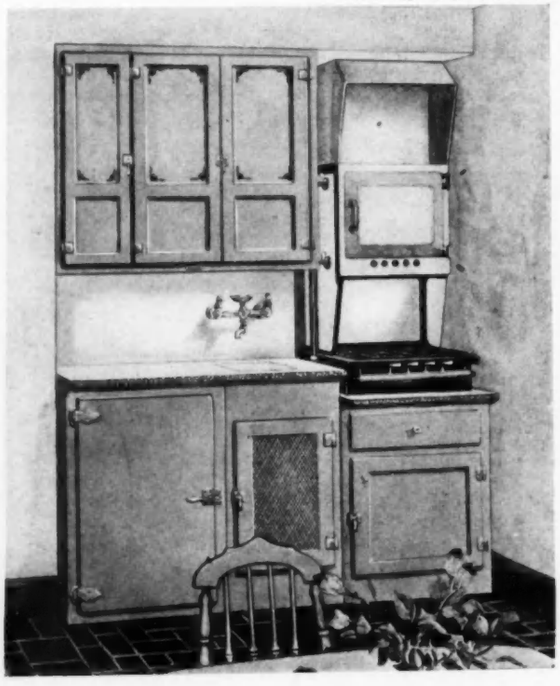
Figure 1. An Efficient and Compact Arrangement of Units. Door Swings Make the Interiors of Cabinets, Refrigerator and Cupboards Available Without a Change of Position. The Location of the Sink and the Pull Out Counters Give Adequate Working Space. Light, Wall Plugs and Shelves Are Placed for the Maximum of Utility. A Ceiling Light Should Be Provided, Switched Automatically by Enclosing Doors. The Butts of These Doors Should Cause No Interference with the Operation of Unit Doors. Metal Grille Should Be Entirely Removable for Access to Sink Trap and Mechanical Unit

A Poor Arrangement. Unit Doors Swing in Wrong Directions; Sink and Drain Installation Is Unsanitary and Difficult to Keep Clean, and Counter Space Is Inadequate. Units Are Cramped Behind Doors

Good Arrangement in a Small Area. Integral Sink and Drainboards Are Easy to Keep Clean. An Oven is Not Always a Necessity in Kitchen of This Size. Pull Out Counters, a Shelf and Wall Plugs Would Increase the Efficiency

Courtesy C. E. Sellers Co.





able in either wood or metal. Counters should be of a material that resists stains, is durable, and is easily cleaned, such as non-corrosive metal, enameled iron, or a composition material impervious to moisture. Sinks should be integral with drains and splash backs. Plumbing fixtures and mechanical units should be easily accessible, but protected from possible damage. Floors should be coved to bases, and small waste spaces difficult to clean are to be avoided. Smooth plaster or tile surfaces are best for walls, as rough textures collect dirt easily. They should be washable. A vented hood over the stove protects ceilings from dirt.

5. COLOR. A treatment to aid light reflection is the best. Walls, ceilings and equipment should be in the same general tone. Contrast in the color of detail aids visual efficiency, but should be simple and direct. Cabinet bases and other parts receiving hard wear and susceptible to stains and mars should be in dark, neutral tones. Simplicity is desirable, but extremes lacking a quality of cheerfulness are to be avoided.

TYPES

The efficiency of the small kitchen is established by layout, size and arrangement of equipment. Types should be chosen in relation to class of tenants, location and rental of unit apartments, and should be carefully planned for the minimum of installation and maintenance cost consistent with these considerations. There are three general types.

1. THE BUTLERY KITCHEN is a recent development for enclosed installation in one-room or studio apartments. No stove is provided, and in large projects it is used as a serving pantry in connection with a complete kitchen. (See Fig. 1.)

A. *Layout.* This varies with different projects. Planning considerations are easy availability, economy in relation to living space, and unit grouping for economy of mechanical installation. Doors should be provided for enclosure when not in use.

B. *Space.* The minimum practical width is 5 feet; the average is about 5 feet, 6 inches. The minimum depth should be about 22 inches.

C. *Equipment* should include refrigerator, 3 cubic feet in capacity, — with mechanical unit

Courtesy Wasmuth-Endicott Co.

The Counter Is Shallow, But Compartments Are Well Arranged for Service and Availability. Mechanical Refrigeration Would Give More Work Space and Increased Efficiency

Courtesy Wasmuth-Endicott Co.

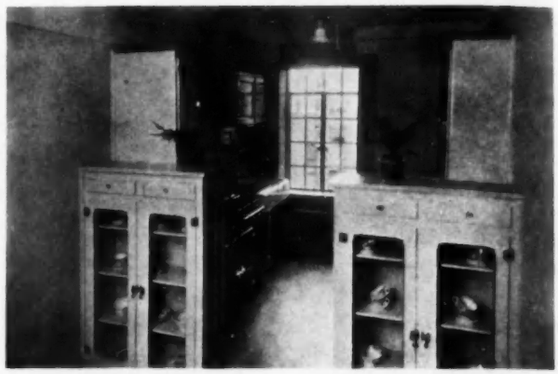
A Good Example of Built-in Units, Well Placed. The Tiling of Drain Boards and Splash Back Is Easy to Maintain. Compartments Are Easily Reached, But Cupboard Doors Swings Should Be Reversed for Maximum Efficiency. A Coved Base Integral With the Floor Is an Aid to Cleanliness

under sink; base cupboard for pots, pans, etc., with cutlery drawer; sink, 14 x 20, or 16 x 24, integral with drain board and splashboard. Pull-out counters are necessary for units of this size. China cabinets should be above the sink. Space should be left at both sides of cabinets to form shelves for storage of cleaning materials, etc. The sink should be set between the refrigerator and base cupboard, and the doors of these units should open in opposite directions *from* the center. Doors of cabinets should be similarly swung.

2. EFFICIENCY KITCHENETTE. This is a larger development of the foregoing. It is also for installation in a one-room or two-room "light housekeeping" apartment. The assemblage of units constitutes a complete kitchen in a shallow enclosed area.

A. *Layout and Space.* The layout of this type would be similar to that of the butlery kitchen. The minimum space—by using a gas refrigerator—is 5 feet, the depth 25 inches in the clear. Although the addition of cabinet units, etc., may enlarge the space to any desired length, the recommended size is about 6 feet.

B. *Equipment* includes refrigerator of about 3½ or 4 cubic-foot capacity, with mechanical unit under sink; base cupboard for pans with two



Courtesy White Door Bed Co.

A Practical Arrangement of Equipment. Space Is Wasted Under a Sink of This Type, But Conserved in the Stove and Refrigerator Combination. A Different Type of Lighting Would Obviate Glare and Shadows.

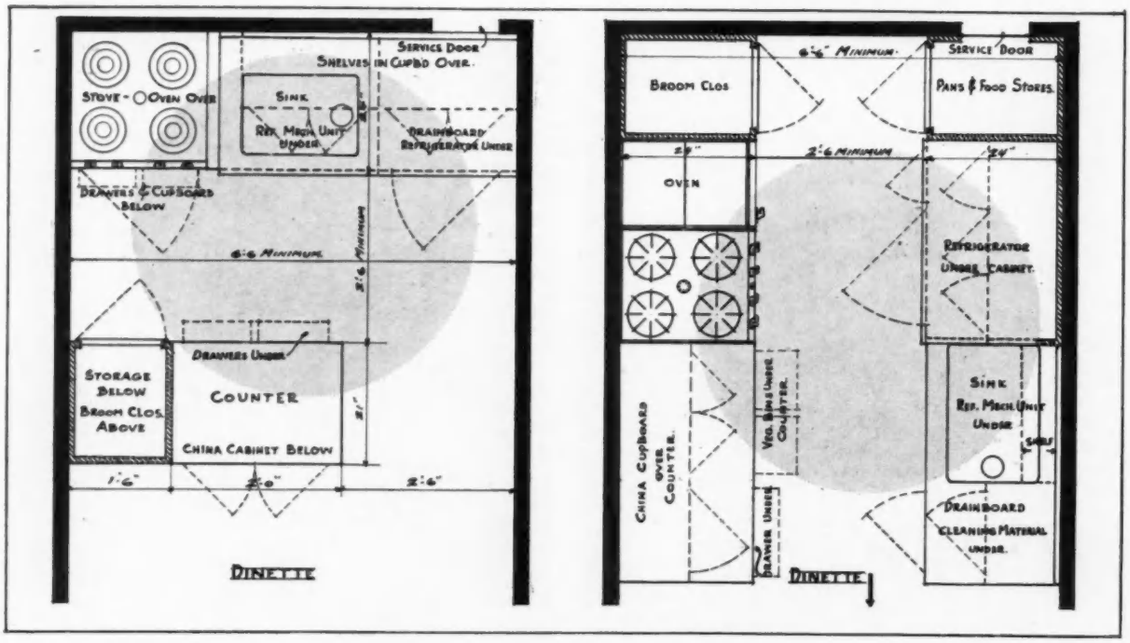


Figure 2. The Shaded Areas Indicate Compactness and Efficient Unit Arrangement in Two Typical Plans. Sizes in Equipment Will Vary, But the Dimensions Show a Minimum Practical Working Space

Courtesy of Herald Tribune Institute

The Kitchen Shown at the Left and in Plan at the Right Below, Is an Excellent Grouping for a Large Apartment Kitchen. A Change in the Model of Refrigerator, and the Installation of Cabinets Above It Would Conserve Space. The Use of Decorative Arches Is Not Essential to the Efficiency of the Room.

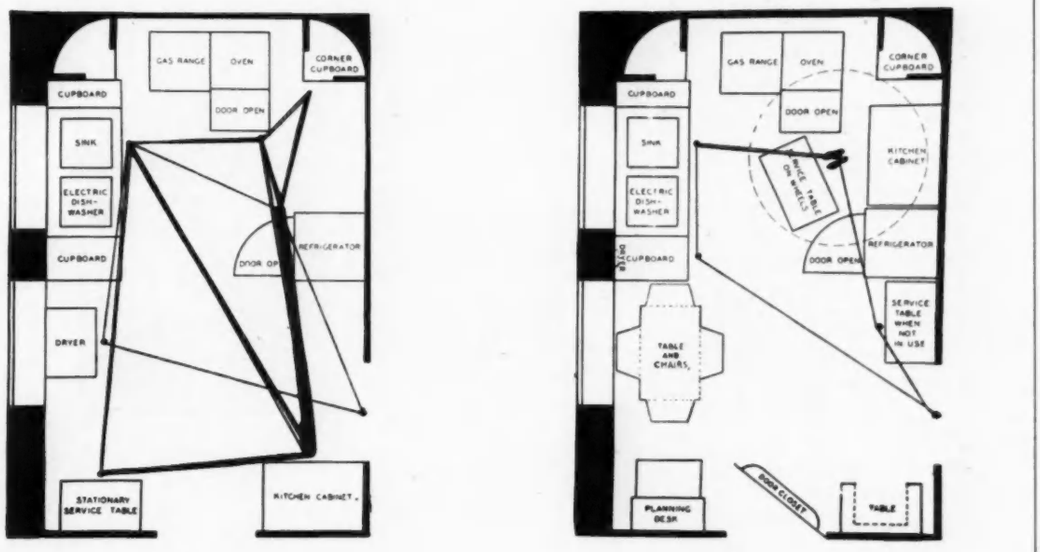
drawers and bread box; sink, 16 x 24, or 18 x 24, with integral drain and splashboard; pull-out counters; stove and oven with vented hood; cupboards over the sink with a shelf next to the hood.

The arrangement of both types should place all equipment and supplies within easy reach of a person standing at the counter.

3. KITCHEN AND DINETTE. Two general types are included under this heading. (See Fig. 2.) The first is a kitchenette with additional china and storage cupboards in connection with a dining space, for use in one- or two-room apartments. The second provides adequate facilities for apartments that include a living room and two bedrooms.

A. *Layout.* The combination of kitchen and dinette normally constitutes a room opening from the living room. Complete enclosure is not necessary in the small apartment, but some separation from the living room is usually desirable. A corridor service door should be provided. Dumbwaiter shafts should be located for non-interference with efficient arrangement of equipment units. If the space is enclosed, a window should be installed.

The Plans Below Show the Value of Proper Equipment Arrangement. A Typical Operation Involving 281 Steps in the Kitchen at the Left, Was Done With But 45 After a Rearrangement of Units Illustrated on the Right



Courtesy of Herald Tribune Institute

Courtesy Curtis Co.

(Left.) Details of Equipment That Save Time and Effort Are of Special Value in Small Kitchens.

(Right.) This Metal Closet Is But Six Inches Deep, Occupies an Otherwise Useless Space, and Provides Compact But Adequate Storage Space

Courtesy of Herald Tribune Institute

B. *Size and shape* vary with different projects. Typical layouts and minimum sizes are indicated in Fig. 2.

C. *Equipment* for the first type has been indicated. Units for the second should include a complete kitchen cabinet; four-burner stove with oven and broiler; mechanical refrigerator, 4 cubic-foot capacity; a sink, about 18 x 24, integral with drain and splashboards; cupboard with vegetable bins; storage cupboards with drawers; and cabinets for glass, silver and china. The size and location of units will vary with differences in layout, but should be considered in relation to compactness, comfort, easy availability and good lighting.

In apartments larger than those implied by the considerations mentioned, the kitchen usually becomes a room separate from others and should be developed as a unit space in relation to the requirements of the apartment layout. As in other types, the conservation of space and effort are important for comfort and efficiency.

Kitchens Should Be Planned With a View to Completeness as Well as Arrangement of Equipment. In All Types Space Should Be Considered in Relation to the Convenient Placing of Necessary Utensils

DRAFTING ROOM PRACTICE IN APARTMENT WORK

BY
LAURENCE AND JOHN SCACCHETTI

THE architect who has been commissioned to prepare plans for multi-family dwellings is immediately confronted with the problem of doing so in a minimum of time in order that the owner may be relieved of carrying charges which increase daily in considerable amounts. It is also to his interest to have the plans completed with a minimum of labor, as these projects are not usually full fee commissions, due to the fact that the owner, who is generally the builder as well, frequently maintains a skeleton architectural force of his own which is entrusted with carrying out those portions of the architect's service which have been omitted to reduce the cost of plans.

The division of the planning of the project, while it may result in an economy to the owner, is generally a prime factor in increasing the cost of the plans to the architect. It is obvious then that the architect who is to realize a profit on such a commission must rely upon a definite system by which his employees may be guided, in order that no unnecessary work or duplication of work be performed.

With mass-production methods injected into every line of endeavor, it seems inevitable that this system should eventually creep into the drafting room. It is now applied to the extent that draftsmen are proud to admit that they are specialists—not for a particular type of building nor a specialized form of construction, but experts in the development of detailed data for a portion of a particular type of building.

There is probably no type of building where "expertizing" has been developed to a greater degree than the apartment house. While sound apartment house planning is comparatively new, the place of the apartment in the world is very definitely established as the ultimate living quarters for all types and manners of urban and suburban people.

As the majority of people in metropolitan districts favor this form of living, a type of apartment must be developed to fit the purse of each class. It is due to this fact that mass-production methods must be applied in the drafting room.

SQUAD LEADERS. It is advisable, in the proper operation of a drafting room, to have a nucleus of squad leaders who are well versed in their branch of work, for in this manner the maximum efficiency is attained. Men who are trained in developing drawings for one type of apartment are either extravagant in the use of space or materials for a cheaper grade of construction, or too parsimonious in the use of these for higher grade work.

Another factor which has forced drastic action in drafting room methods is the intensive development of realty which has done so much to enhance land values. An owner is quite unwilling to allow his architect to experiment with an untrained force on a project where the daily carrying charges assume alarming proportions for even a moderate-sized project. A delay in the drafting room, even though of minor duration, may mean the difference between a paying venture and a failure. A holdup of this nature tends to inject a panicky feeling into all involved in the project. It leads to the issuance of incomplete or incorrect drawings which, in turn, leads to misunderstandings and errors in buildings and, of course, "extras" to be paid for by the owner.

STANDARDIZATION is the only remedy for inaccuracy and limited time. Oversystemization retards progress and clutters an office with files whose place should properly be taken up with men. The reduction of overhead depends a great deal on the drafting room efficiency.

THE "SET UP." In adopting methods of standardization, the system, to work properly, must start with the first line that is drawn. A sketch for a proposed building should not be started until all the requirements are known. Without drawing a line, it should be possible to pre-determine from tabulations on previous work, the approximate number of rooms available, from which is determined the best possible division of suites. Approximate cubes may also be worked up on this basis, which result may determine whether the scheme as outlined possesses the merits attributed to it by an anxious promoter or overzealous architect.

FIRST SKETCHES. Familiarity with all details concerning a site for an apartment building is an invaluable asset to the architect in making his first studies. If any savings on drafting room costs are to be made, the best time to conserve is at a project's inception. Almost invariably, the first scheme is also the last in the office of the architect who is familiar with this type of work.

The individual entrusted with the development of a sketch for a new project may utilize tables to considerable advantage in the preliminary

work. While these, at best, are "rule o' thumb," they have been found to be time savers. The tables here shown are examples of this. Though the plots used as a basis for comparison have been selected at random from a group of buildings recently erected, it should be noted that while the sizes and areas of the plots vary to a considerable degree, the net and gross average areas allowed to each room remain quite consistent, with just slight variation.

A sketch is more than an indication of the lot's possibilities. It should be considered as a preliminary working drawing. All legal requirements for exits, light and ventilation, construction, and the thousand and one details which are apparent when the project materializes should be taken into account before issuance. Usually these sketches should be accurately drawn at the scale 1/16 inch = 1 foot.

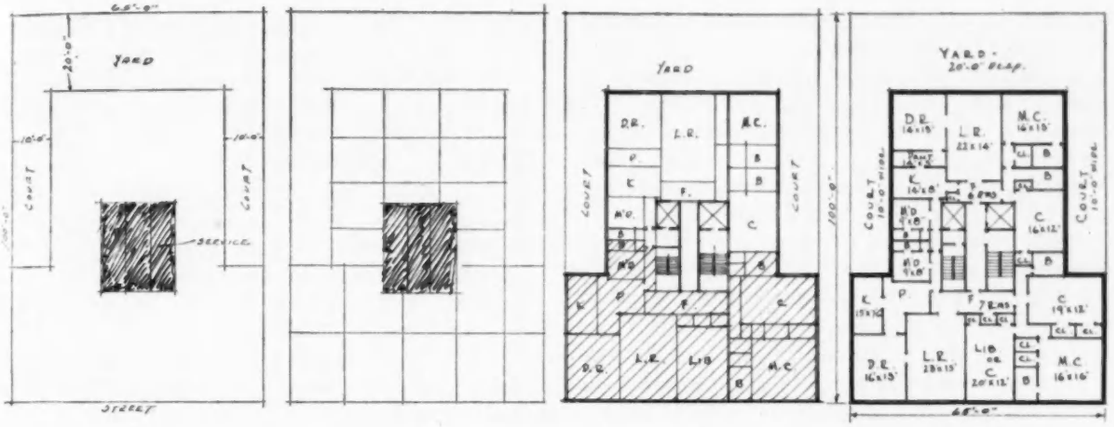
"**RUBBER SKETCHES**" are those optimistic rough layouts so called in the drafting room, due to the fluctuating and diminishing of room sizes and clearances, which should be avoided. In addition to making a bad impression on owners, whose spirits are bolstered with promises of large rooms only to have these hopes shattered when the sketches are converted to working drawings, they work incalculable harm in the drafting room. Much time is wasted in attempting to regain space on a plan which never existed, but was indicated on the "rubber sketch." If thicker walls are required for fireproofing or structural reasons, they should be considered at the time the sketch is drawn. Honesty is the best policy, particularly when the outcome will prove more disastrous to the offender than to the victim.

STARTING WORKING DRAWINGS. When the project materializes, it is essential that it be put through the drafting room in the least possible time. In speculative work the architect is rarely commissioned to proceed until all financial details are complete. This means that carrying costs are charged by the owners against the project from the day the architect is commissioned to prepare plans, and hence the necessity for speed and accuracy. It is at this point that the architect reaps the benefit of having a complete and accurate sketch, which may be taken and dimensioned for courts, yards, rooms, stairs, and in fact everything that is necessary to lay it out quickly and accurately. It is obvious that a small-scale study is better for "revamping" than the more cumbersome quarter-scale.

When dimensioned, the sketch is then laid out on tracing paper, and the structural engineers are consulted for column layouts which are worked out together with the architect. In the meantime small-scale studies of fenestration are being worked out from the figured sketch, and changes

TABLE OF AVERAGE AREAS

Size of Plot	Area of Plot in Sq. Feet	% of Lot Occupied	No. Apts. per Floor	No. Rooms per Floor	Gr. Area per Room Sq. Feet	Net Area per Room—Minus Courts and Yards. Sq. Feet
CORNER BUILDINGS—CLASS A						
50x100	5,000	82%	1	12	417	342
57x120	6,840	80%	1	14	488	390
75x125	9,375	78%	2	21	446	348
40x120	4,800	83%	1	11	437	364
64x100	6,400	82%	1	14	457	375
75x90	6,750	80%	2	15	450	355
67x75	5,025	80%	1	11	457	366
100x110	11,000	73%	2	24	460	333
60x100	6,000	80%	1	13	461	373
100x150	15,000	76%	3	32	469	354
		Average			454	360
INTERIOR BUILDINGS—CLASS A						
50x120	6,000	65%	1	11	545	355
25x120	3,000	65%	½	5½ duplex	545	355
70x94	6,580	70%	2	13	506	354
66x100	6,600	70%	2	12	550	385
80x102	8,160	70%	1	16	510	357
		Average			531	361
CORNER BUILDINGS—CLASS B						
100x100	10,000	74%	5	22	3-4-5-6	rms.
58x115	6,670	82%	5	14	2-3-4	rms.
75x90	6,300	77%	2	15	420	325
50x100	5,000	80%	2	13	383	307
56x90	5,040	78%	3	14	360	280
110x110	11,000	70%	7	30	366	265
62x100	6,200	80%	4	16	387	311
		Average			383	298
INTERIOR BUILDINGS—CLASS B						
50x100	5,000	65%	3	12	417	270
75x100	7,500	70%	5	18	416	291
50x100	5,000	70%	4	12	417	292
80x100	8,000	70%	4	22	364	255
110x110	10,000	70%	6	22	455	318
88x110	8,800	65%	4	20	440	260
88x100	8,000	70%	4	20	400	255
		Average			416	278
CORNER BUILDINGS—CLASS C (*Non-Fireproof*)						
Irregular	12,000	77%	9	31	386	295
102x144	14,688	73%	11	41	360	262
100x100	10,000	80%	9	29	345	276
Irregular	21,944	76%	22	64	348	258
100x110	11,000	80%	9	32	343	275
100x145	14,500	76%	12	44	320	250
		Average			349	269
INTERIOR BUILDINGS—CLASS C (*Non-Fireproof*)						
Irregular	16,725	65%	9	39	429	278
100x131	13,100	65%	10	32	410	270
100x100	10,000	70%	10	24	416	295
100x100	10,000	70%	10	28	357	250
100x120	12,000	70%	10	30	400	260
100x110	11,000	70%	8	28	392	275
		Average			400	271



A B C D

Development of Preliminary Plans

A. Plot layout, Accurate as to Dimensions and Angles. Locate Mandatory Unoccupied Areas; Also Courts and Yards for Light and Ventilation, Thus Establishing Envelope. B. Approximate Number of Rooms Determined By Cross-Section of Average-Room Sizes for Class of Apartment. Determine Location and Approximate Area of Stairs and Services. C. Divide Area Into Approximate Actual Rooms, Considering Orientation, Circulation, etc. D. Develop Plan and Balance Units

in walls and partitions are made before the engineers have advanced too far with any definite framing. Mechanical and sanitary engineers are also provided with the preliminary data in order to be made acquainted with the project. The architect will also avail himself of the engineering advice maintained by all elevator companies to obtain a layout for architectural and structural purposes. In this manner loads and impacts on beams and columns are definitely determined at the proper time, requiring no revision of structure at a later date.

CONCURRENT PLAN DEVELOPMENT. The alert captain will obtain prints of the preliminary typical or governing floor layout when sufficient dimensioning has been done, and distribute these drawings to other men for the purpose of laying out upper or lower floors, or other arrangements varying from the general layout. First or ground floor plans are studied for entrance requirements; cellars are sketched out to develop a scheme of circulation for service and equipment; upper floors are studied with an eye toward conserving space where setbacks or other legal limitations restrict the layout.

SECTIONS. Preliminary sections through the building are started as soon as the typical floor arrangement is settled. Only in this manner may the always serious problems of stair headroom, curb lines and grades be settled. Beam depths are assumed prior to the receipt of framing plans. For each type of house, experience only can show which depth beam is most economical to use for uniform, symmetrical and inexpensive framing.

SCHEDULE OF DRAWINGS. One may gather from the foregoing that the development of apartment houses is nothing more than a series of guesses, each subsequent guess being a little more accurate than its predecessor. It is only by assumption that a definite result is obtained. Moreover, the assumption is not confined merely to drawing; it is also used extensively in scheduling the project for the proper coördination of all work common to commercial architecture. The director in charge of a project will usually schedule it for its various stages in order that he shall at all times be familiar with and be in position to determine the status of a project by merely glancing at his data sheet. This may be arranged in the form of a graph, a chart, or by memoranda. A system which is quite simple is illustrated herein. Fig. 1 shows a chart for an apartment building from its first stages to the period of filing in the municipal bureaus. This type of schedule permits laying out work for a period extending from a few weeks to several months. The diagram is a simple affair, which may be drawn out and run off on a mimeograph at a very small cost.

The squad leader at the job's inception, will estimate from experience the time required for developing each drawing and may, if he so desires, write in the names of the men working on each sheet. If properly worked out, one will not find a discrepancy or variation exceeding 5 per cent in the length of time required to carry a project through to the various stages of completion. Moreover, a constant check is maintained over work not being directly handled in the office. The assumed time is of course shown on the chart in a black, unbroken line. Changes in the schedule may be made with crayons, such as red for work behind schedule and blue for drawings in advance of the time slated for their issuance.

LEGAL REQUIREMENTS. In preparing drawings for examination in the bureaus, it is imperative that all legal phases be amply covered. Avoidance of the issue or incomplete data will never

escape the eye of the trained examiner. Vague information or ambiguous notes will serve only to aggravate the official and make him more cautious, causing delay on an approval. A thorough knowledge of all legal requirements combined with experience to show a minimum of confusing information, will go a long way toward securing a speedy approval. The departments are not concerned with decorative features, nor whether the flooring is to be of a stock or a special pattern. Only those doors which affect egress or privacy need be shown on filing plans; no mention need be made of wall or ceiling treatments; closet dimensions are superfluous. Briefly, only the work involving structure, light and ventilation, fire precautions and sanitation need be indicated. Information other than this means wasted effort for the examining authorities.

The legal requirements may, for our purpose, be separated into four main subdivisions as follows:—

1. Height and Bulk of the building, which are regulated by any existing zoning ordinances and which deal with the percentage of the lot which may be occupied by the building and the height at the street front, the minimum area which required yards and courts may contain for given heights, as well as any permissible setbacks, dormers or pent houses. This does not, however, include any private restrictions which may exist in certain localities.

2. Light and Ventilation, which in addition to any yards or courts required under the previous heading, include additional open spaces from which rooms are to receive legal light; the minimum permitted sizes of living rooms, kitchens, bathrooms and water-closets, etc.; the minimum sizes and areas of windows serving these spaces; the sizes of alcoves or alcove rooms when and if permitted, and the openings between them and legally lighted rooms; the method of ventilation for bathrooms, water-closet compartments and other spaces not in direct contact with the outer air; and the required number of air changes if mechanical ventilation is to be used. Under this heading may also be included the division of certain rooms by the use of low or dwarf partitions or such fixed equipment as may by law be permitted, such as china closets or dressers between kitchens and dining alcoves.

3. Fire Protection; which concerns the minimum number of exits from apartments, the minimum number of stairs, fire escapes, fire towers, horizontal exits, stair halls, elevators, elevator shafts, elevator vestibule, public halls, corridors, the minimum permitted size for each, their location; the method of separating them from the living portions of the building and from each other. Also any required standpipe and sprinkler lines, their tanks, hose, hose racks, pumps and any lot line windows and doors or those windows and doors which may be on yards or courts of less than certain specified dimensions.

4. Sanitation, which deals with the minimum number of water-closet and bathroom accommodations required, plumbing fixtures, soil, waste and vent lines, water supply lines, heating apparatus, etc.; also the permitted uses for certain portions of residence buildings for other than residence purposes, as well as the privacy of rooms and bathrooms from other rooms.

All of the foregoing requirements are to be met in both the fireproof and the semi-fireproof types buildings, although they vary for each type of building to a considerable extent.

This, then, completes the plans for examination. An office that is properly equipped to handle this type of work may generally proceed with reasonable speed in the development of drawings to the next stage, even though the plans are in the hands of the municipal authorities. Having a good working knowledge of the laws, the examination is regarded more or less in the nature of a check. No intentional violation of law having been committed, it is fairly safe to proceed with the completion of drawings for estimating.

DRAWINGS FOR ESTIMATING. It is at this point that accuracy in the previous stages of the work is of material benefit. The tracing paper drawings which were used for filing are as a rule somewhat abused, due to re-study, changes and corrections, due to structural or mechanical conditions, and are likely to be somewhat out of scale. Estimating plans must be accurately drawn in order to bring out all those conditions which ordinarily constitute extras if not properly shown. As these drawings form the basis of the contract, they must be complete and accurate for their purpose.

If it is the intention to issue the drawings at stated intervals for estimating by various trades, one system is employed. On the other hand, if the project is slated to be sent out for general contract bids, another method must be followed.

SUBCONTRACT METHOD. If the former is the method decided upon, the project is scheduled as hereinbefore stated, substituting the chronological order of trades as they would be employed on the work; for example, the data required for foundations, masonry, steel, concrete and concrete floors, together with sufficient other incidental information in connection with these trades to avoid extras, are shown and the drawings issued. Other trades follow in their proper sequence until the final drawings are ready for the complete structure.

GENERAL CONTRACT DRAWINGS. In the case of a general contract, the drawings are

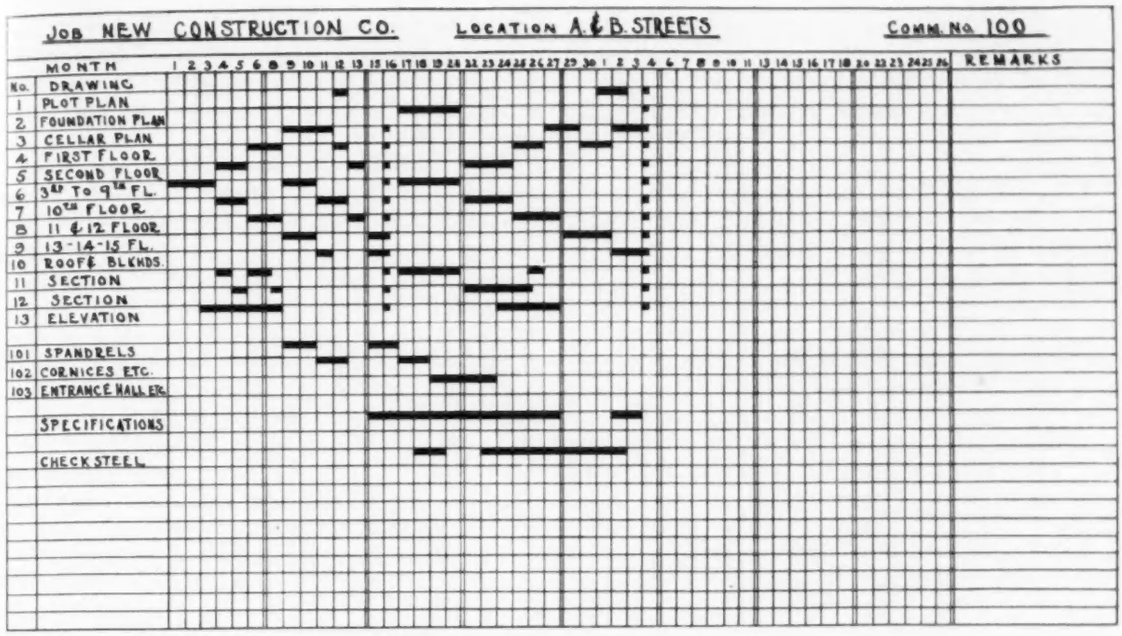


Fig. 1. Drawing Schedule Showing Dates of Work on Drawings. Two Weeks Are Here Allotted to the Set for Filing with the Building Department, and Three Weeks More for Completion of the Contract Drawings

withheld until all trades are properly covered with sufficient data to present a complete picture by implication, if not actually shown. Specification and schedules of finishes are rough-drafted and gone over by the squad leader and the specification man. Here again a great deal of time may be saved by having a complete specification file. Where sufficient data are available from other buildings of like characteristics, a specification may be taken bodily, and by employing a system of insertions and corrections or cutting out and pasting in revised paragraphs, a specification can be developed very quickly for checking with the owner's requirements.

CHANGES. As changes usually involve considerable expense in the drafting room, a constant check must be maintained over all drawings. Where structural or mechanical information is not forthcoming at the proper time, revisions of the drawings to incorporate the delayed data are bound to occur. This delays the work, tends to demoralize the draftsmen, who quickly lose interest, and increases the chance for errors. Sufficient larger scale details should be worked out and the information transmitted to the consultants. Spandrels, cornices, and exterior details must be drawn for the structural men; special methods for running piping, or minimum clearances for the passage of duct work must be passed on to the mechanical engineers. Unless this is done they must either assume a solution or delay the work until properly informed, both inefficient practices.

Coördination of all the elements involved in the proper conduct of an operation is the secret of successful handling of commercial work. Consider what one day's delay on the part of the consultants, due to lack of information, may mean to an architect who has a group of men delegated to a project. He may force the work to go on regardless of the consequences, resulting in perhaps two or three days of changing to suit the final condition, with the chance of errors of omission or commission creeping in.

DETAILS OF ESTIMATING DRAWINGS. Estimating plans are considered as such only when all the points governing the trades involved are covered. Checking lists should be employed and all discrepancies noted on a sheet, and as each correction is made, crossed off the list. By this method the chances of a slip-up are quite remote. For estimating purposes the drawings need not be completely dimensioned; equipment need be merely indicated, and even the correct location or swing of doors, definite position of lighting, radiation or plumbing if not far off from its final location need not be shown. Furred spaces, and indication of materials and finishes and structural requirements are of course imperative for a complete estimating plan. Small-scale studies of interior arrangements are of great benefit and generally expedite the figuring of an estimate and minimize the number of questions to be answered

regarding them. These are useful to the architect who, as a rule, shelves the project during its early stages of construction and remembers it only when the call comes for details, at which time a small-scale idea will go a long way toward refreshing his memory.

CHECKING. When the plans have been issued for estimating purposes the man in charge will coördinate all branches of work and settle on a definite policy of completion.

The plans are checked for general dimensions in order that the framing may also be checked for position. Spandrel beams are checked for masonry, window or door clearances; interior framing is placed with regard to shaft and hatch clearances, with proper fireproofing allowance. Other framing is studied for symmetry and spacing. When this has been located on the typical floors, a re-check is made to establish beam levels and clearances to allow for horizontal pipe or duct runs. Notations of changes are made as desired on either structural or mechanical plans. Familiarity with a project will permit a checker to bear in mind the intent of the architectural plans and be guided accordingly in his corrections. It is unnecessary to fully complete the checking for an entire project at one time. While other sheets are in progress of checking, those bearing notations may be returned to the engineers for correction. In this manner all those interested may be furnished with sufficient information to keep the project moving. Additional corrections are bound to occur, but these can quickly be picked up and the changes made without delay. This procedure is followed until all scale drawings are complete. The plans then receive a final check against the specifications, and the necessary corrections to the former and addenda to the latter are made. The construction plans are now complete.

DETAILING. No work can be carried along very far without details. Even though a portion of the work would not be affected for a considerable length of time, it is advisable to detail it while the draftsmen still have the "feel" of the work. Those details peculiar to each project are likely to become hazy if this important work is shelved until actually needed for construction. Furthermore, large-scale drawings bring to light numerous defects in plan or design which may easily be remedied by a revision issued before that portion of the work is reached. If some details are worked out in conjunction with shop drawings of work previously detailed, the entire project may be correlated and the amount of drawing considerably reduced.

SHOP DRAWINGS should be checked immediately when received. They may often bring to light defects in drawings previously issued, requiring revisions to the work of other trades. A tickler system of cards may be employed to show when shop drawings governing certain trades should be in the architect's office. This system of expediting work of subcontractors is as useful to the architect as it is to the owner or builder. An office that does considerable work may delegate a clerk to investigate the tickler file and bring these cards to the attention of those interested. Otherwise the squad leader may handle this item in conjunction with the rest of his schedules.

No project is complete in the drafting room until the last nail is driven in the building. It has never been possible to carry a project through to completion without some correspondence or telephone calls. The type of drawings and the administration of the work will be made apparent when requests for information or interpretation come through. If these are reduced to a minimum, the project's costs and attendant overhead will show up favorably.

SUPERVISION. The supervision should be entrusted to one who has had sufficient experience to realize the necessity for adherence to the drawings, and with a mind broad enough to render decisions where variations are made necessary by conditions, always keeping in mind the legal requirements governing, and not permitting the installation of any work that will reduce clearances or constitute a hazard or a legal violation.

While the foregoing suggestions may be applicable to most offices in whole or in part, it must be remembered that the type of work as well as the temperaments of the individuals involved preclude the possibility of making a definite recommendation for the management of all work. Each office must have its own system built around it to fit its structure. Constant changing of system does more harm than good. Efficiency in drafting room methods can be obtained only where the employes are well trained for their particular work, whether it be planning, designing or detailing.

MECHANICAL AND ELECTRICAL EQUIPMENT

BY

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A GREAT deal has already been written regarding the mechanical equipment and features of the office building. This article will attempt to show how the design of the mechanical and electrical installations of an apartment house and apartment hotel of ordinary size differ from the tall buildings. It might be well to keep in mind the fact that office buildings are built for a large number of persons per unit of area, whereas apartment houses and apartment hotels are built as living places for a small number of people per unit of area. Also in the latter each tenant has his individual tastes and idiosyncrasies.

The cost of the structure, the rent schedule, location of the property, type of management and other factors, all tell the engineer what type of installation to design and what the expense of the mechanical equipment can be. Of course, there is an absolute minimum below which the engineer will not attempt to equip a building, but as a general rule, he must work within a budget.

His design will not necessarily be the most economical at all times, for the engineer must sacrifice economy in design to suit architectural treatment as will be illustrated later. In spite of that, all systems must be flexible and simple to operate, inasmuch as the superintendent of the building must be able to control and make minor repairs of all systems himself.

Competition in renting has forced the owners and builders to design their buildings to give more to the prospective tenant for the same rent than the next owner. The rooms given most attention in this matter should be the bathroom and kitchen, where, for a small increase in building costs, the owner achieves a noticeable effect.

BATHROOM

In the apartment hotel one finds bathrooms of moderate size with medium priced plumbing fixtures of sturdy construction and good wearing qualities, for this type of tenant will give hard usage. Here, everything is very simple, like the hotel bathroom, with the necessary bathtub with shower over, lavatory and water-closet. Colored fixtures are not usually installed as these apartments may be used by a great many people for short periods and the expense is unwarranted.

Since the passing of the Multiple Dwellings Law, in New York, it is possible to have secondary interior bathrooms in apartment houses, and the engineer is now required to provide adequate ventilation for these rooms. This is accomplished by connecting each bathroom to a large fan by duct work, the fan located at the roof level. Great care must be taken that the system will operate without noise. To this end, the engineer must design a balanced system with low velocities. Grilles are placed in each bathroom connection with louvres for control.

In the better class apartment house, we find color being used extensively, usually only upon request of the tenant, as otherwise renting troubles will start, because the color selected for a given apartment may not be to the tenant's liking. Bathrooms should be designed so that they are as noiseless as possible. The engineer may help in this respect by arranging his fixtures in such a manner that local noises are confined, and by reducing the velocity of the water.

PLUMBING

In the best apartment houses the materials which go into a plumbing system proper are of the best qualities. The best pipe is generally used throughout for both hot and cold water systems, galvanized wrought iron is used for vent lines; all soil, waste, drainage, sewers and leaders 3 inches and over are constructed of extra heavy cast iron pipe with bell and spigot joints and similar fittings; all such piping smaller than 3 inches is usually galvanized steel pipe with galvanized recessed drainage fittings. All vent piping is standard galvanized steel pipe with galvanized cast iron fittings, except where extra heavy cast iron pipe is permitted.

KITCHENS

The kitchen is sometimes ventilated by an electric kitchen fan mounted either in the window or in the wall. This fan not only eliminates all cooking odors but relieves stuffiness.

The electric requirements for a kitchen are varied. Provision must be made for refrigeration, cooking, dishwashers, toasters, heaters, beaters, and electrical appliances of all sorts. This is essential in the larger apartments where a great deal of entertaining is done. Such equipment frequently requires heavier wiring as well as more convenience outlets.

KITCHENETTES

As a general rule, kitchenettes are ventilated through a duct system similar to that for interior bathrooms, with a fan located at the roof of the building, and this system eliminates all cooking

odors, so that the one-room apartment may appear as a living room of a large apartment. Lighting, in the kitchenette, is provided generally by a drop light, and adequate provision must be made for cooking, either by power electric outlets or by gas.

HEATING

The greatest heating problem arises in studio apartments, especially if the studios are one and a half stories high. Here one side of the room is glass in its entirety, requiring a great deal of heat with no place to put the radiation. In such cases the convection type of radiator is often the solution.

Usually the walls are recessed to receive these radiators and the radiators finish flush with the wall. Where there is a set-back roof and doors as well as windows open onto it, radiators are placed under the step leading to the set-back roof or set in an unimportant room adjacent with grilles to allow hot air to enter.

LAUNDRY

Nearly all apartment houses and apartment hotels have provisions for laundering located in the cellar. A combination sink and wash tray in the kitchen is used by the tenant mostly in cases of emergency, and the main laundering is done in the cellar, where porcelain wash tubs are arranged in batteries, with gas burners for boiling between each pair of tubs, and wringers and other modern equipment are provided. A separate room should be provided as a drying room and another as an ironing room.

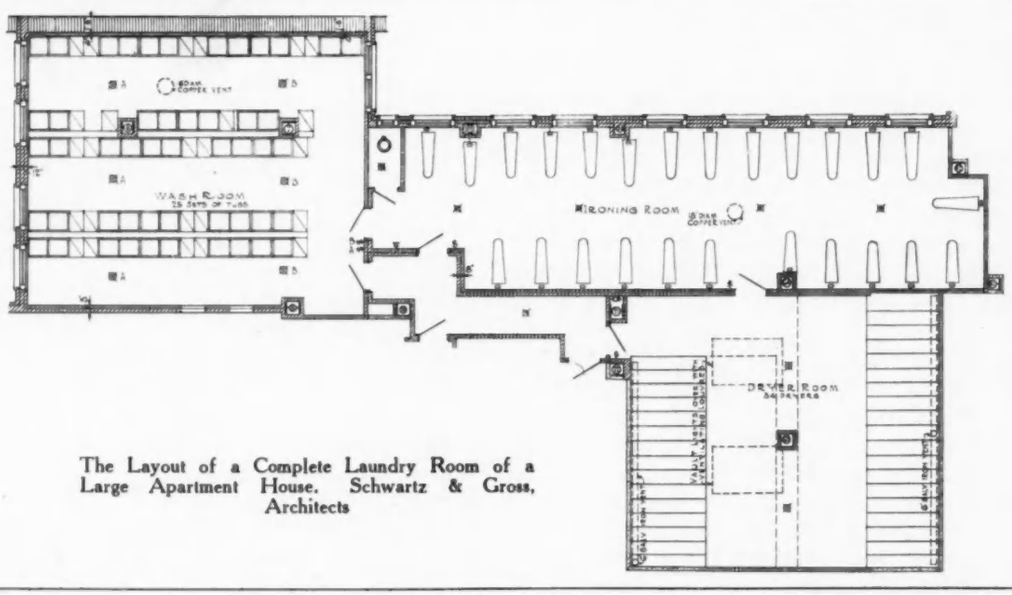
In the drying room metal drying racks should be installed, usually one for every three or four apartments, arranged in file. The clothes are dried either by gas burners or steam coils located under the racks. A lock is provided on each rack so that clothes may be safely left.

In the ironing room, ironing boards of the same number as drying racks should be installed. The boards must be of very sturdy construction completely covered and ready to use. Boards are arranged, systematically so that ample space is provided for all paraphernalia. A typical laundry layout for a large apartment house is shown.

Electric layout for the laundry is simple, washroom and drying room requiring but ceiling outlets for general illumination. The ironing room has a convenience outlet at each board for the electric iron and a drop light fixture over each board, or general lighting.

The ventilation of the laundry is a serious problem and it is advisable to get as many windows in this space as possible. An exhaust system of ventilation should be installed to rid the laundry of excessive heat and laundry odors. In the better type apartment house this exhaust system is frequently installed in conjunction with the ventilating system for the first floor, service rooms and servants' quarters. In the cheaper type apartment house free air exhaust fans are installed in the laundry windows and air circulated from other parts of the cellar. In such cases where even this expense is not warranted, a 6-inch galvanized vent is provided from the dryers to the outside air and an 18-inch copper vent from the wash and ironing rooms.

The electric system for multi-family homes usually requires a transformer vault to change the high tension alternating current to low.



The Layout of a Complete Laundry Room of a Large Apartment House. Schwartz & Gross, Architects